

# Medical Times

THE JOURNAL OF THE AMERICAN MEDICAL PROFESSION

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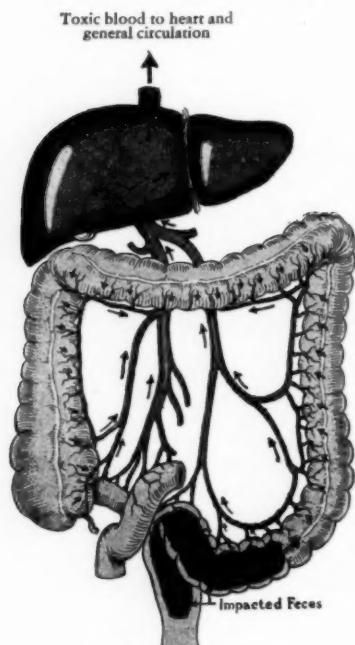
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## Medical Corps Training at Camp Snelling, Minn.

GEORGE B. LAKE, M.D.

COLONEL, MEDICAL RESERVE.  
North Chicago, Ill.

### The Gathering of the Clans

There is something curious about military service. Once a man has had a real taste of it—no matter how much he may "belly-ache," outside, about the "hardships" of Army life—he never can really get it out of his blood. The receipt of an official order gives him a bit of a thrill and the sound of a bugle quickens his pulse just a little. And doctors, remember, are *men*, just the same as everybody else.

So, when the orders come and we report at camp for the summer training period, we find many of the same old bunch we have been associated with during the World War—or perhaps on the Mexican Border or even earlier than that—and have seen in camps year after year.

The assembling of a large group of Medical Officers is a regular "Old Home Week" or a class reunion. Old bunkies slap each other on the back, call each other by their first names, and caper around like a bunch of youngsters.

"The last time I saw you was at Bordeaux—or Camp Grant or Carlisle Barracks! What have you been doing for your Country since then, you old Indian?"

They growl about getting up at 5:30 A. M. and about being ordered around and various other things—but they love it!

And then there are always the youngsters and the newcomers to be broken in and taught the ropes; and there is *none* of us so highbrow that we don't get a little "kick" out of telling the other fellow how to do it.

The little camps, where a dozen or two Medical Officers get together are fine stuff, of course, but it takes the big camp like this to put the real punch into the thing and to make us eager for a chance to get in on the game.

### Regularity, Punctuality and Discipline

We're an irregular, unpunctual, undisciplined crowd, most of us; temperamental mavericks, impatient of any suggestion of dictation and jealous of our privilege of going it alone. A big camp of our confreres is the place to learn the power and joy that inheres in unified and cooperative effort and to find out what fine chaps our neighbors really are. It does the famous surgeon from the city good to take orders from a regular officer years his junior or from the unknown practitioner from the country whose soldierly enthusiasm has carried him to a high military rank. It restores the sense of proportion—which is the real essence of the sense of humor we all value so highly.

And if we take the discipline seriously and play the game strictly according to the rules we get far more out of it than we do if we say, "Oh, what's the difference? This is peace time and a little tardiness or talking in ranks does no harm." We ought to be *real* soldiers while we're about it.

### Welcome and Suggestions

Colonel W. E. Welsh, the Post Commander of Fort Snelling, welcomed us cordially with the statement that all officers of the Army of the United States—Regulars, National Guard and Organized Reserves alike—are *really* reserve officers in that we will unite in organizing and training the man power of the Country if it ever becomes necessary to do so.

The Organized Reserve is no longer an experiment. It is definitely on its feet and the 15-day training periods each year are the most important part of the work we are doing because it gives us a chance to get together and know each other and to pick up practical points which we can carry home for study during the year.

Colonel George A. Skinner, the Senior Instructor,

emphasized the value of association and mutual adjustment among the officers as being superior to that of the actual instruction.

Military customs have the force of unwritten laws and their observance marks the trained soldier. As a rule, these customs of the service are no more than a punctilious observance of the amenities of gentlemanly conduct. However, it gives the experienced officer a

everyone was doing his best to deport himself like a soldier.

Everybody attended calisthenics, conducted by a different officer each morning so that many might gain experience, at 6:00 A. M. and the organizations began to go to various classes and other exercises in military formation.

The drill schedule reached its climax in a formal



1.—Four Colonels: (l. to r.) Barnes, of Omaha; Nesselrode, of Kansas City, Kans.; Cottam, of Sioux Falls; and Silsby, of Springfield, Mo.



2.—Setting-up Exercises.

shock to see another officer, in full uniform, going down the street carrying an open umbrella, as happened the other day.

We must be patient with the policies announced by the War Department until we can see how they work out. If they are unsatisfactory they can and will be changed.

In an emergency we shall probably have to rely on unit training so we had better try it out thoroughly, now, to find out and remedy its weak points.

One of the most important functions of Reserve Officers is to instruct the public as to the truth and necessity of military preparedness. This is the only antidote for the pernicious propaganda of pacifism which is being widely disseminated. Physicians have a great influence in their communities and must use it fully in this matter.

#### Drill and Classes

Major Bernard Lentz, the famous Infantry drillmaster, took us in hand and showed us up as an "awkward squad." It is a wise man who knows his right hand from his left when he gets the command, "Right face." We did better before the two weeks were over.

Instruction by Organization Commanders and Executive Officers from the Regular Army went on all day and every day, with practical terrain exercises in the field in the afternoons. We may get lost in the jungles of Minnesota, but even that has its instructional value.

#### Sports and Pastimes

There is a sort of golf course on the post where the enthusiastic hold forth—if they can find time. A tournament is being arranged.

The more energetic ones are playing tennis. Those who get enough exercise with drills and setting-up exercises take their recreation sitting down. Some spend their evenings in town. The most popular pastime is "chewing the fat."

It's hard work here truly, but it is *different* and so we are having a real and very profitable vacation.

#### The Second Week

The second week found us settling into harness and straightening out nicely. The drill began to go more smoothly and, except for a few natural-born mavericks,

parade in which the Medical and Quartermaster officers participated and which went off well.

#### Instruction

Much of the instruction in the various units was done by members of the several organizations and, on the whole, was well done.

The internal military economy was maintained by adjutants, executive officers, officers of the day and other officials and functioned better than one had a right to expect.

The organization and functioning of a Medical Regiment is little understood by most medical officers, including a number of those in the Regular Army, as it is a comparatively new unit. Much stress was laid upon the duties and activities of these units, and their place in the scheme of the Division was carefully outlined.

In addition to this wholly new work, many changes have recently taken place in administrative details, so that even those who have had considerable military training will find themselves at a loss unless they have kept posted. These matters were briefly reviewed so that, at least, we found out how little we knew.

The system of training by the solution of problems is a fine idea. It gives the students a chance to learn in the most valuable way—by practice.

#### Terrain Exercises

The afternoons of the second week were spent in terrain exercises and the solution of tactical problems of the Medical Regiment. All of the various units of the regiment were thus studied as to their functions and operations. Those who participated in these exercises (which means most of us) learned a good deal about the importance of having good maps and knowing how to read them; also we gained some idea of the heavy responsibilities and exacting duties of Regimental and Battalion Commanders.

On Friday, July 15, the students of the Medical Section, R. O. T. C., gave a splendid demonstration of the actual functioning of the personnel of the Medical Department in combat.

A hypothetical combat zone was laid out on the edge of the bluff overlooking the Minnesota River and here



were set up battalion and regimental aid stations; a collecting station; ambulance battalion headquarters and a hospital station. Everything was complete, on a small scale, even to the animal-drawn and motor ambulances plying between the various stations according to the "shuttle system."

Hypothetical wounded men were tagged, given appropriate treatment and evacuated to the rear, exactly

pital units and the officers of these organizations should be ordered to camp so that they can function along with the Medical Regiments and learn the relations which should exist between these two types of organizations.

4. The instruction in these camps should be strictly military. The doctors who go there are well trained in medicine but need to be made into *soldiers*.

5. Every Regular Army and Reserve Officer should



3.—Littering a Patient to the Rear.



4.—The regimental Aid Station.

as they would be during active military operations. This was highly instructive to all concerned.

#### Lectures

During the second week the whole medical group heard lectures by Col. Louis Wilson and Col. Geo. A. Skinner. The former talked on ballistics in relation to war wounds, and emphasized the fact that all nations are developing small arms with higher and higher muzzle velocities. Missiles traveling at these terrific speeds will disseminate bacteria widely and rip arteries at a considerable distance. Other countries are studying this problem intensively but we are neglecting it.

Col. Skinner discussed the Hospital Center and stressed the importance of convalescent camps and organized amusements at these Centers.

#### Amusements

The time for amusements proved to be much less than some had expected. The work of the Camp kept most of us amply busy all day and many of the evenings. Golf was the only game which aroused much enthusiasm. The tournament was won by 1st Lt. Lester E. Garrison, of Chicago. A few of the officers attended most of the R. O. T. C. dances.

On the evening of July 14, the officers of the 372d Medical Regiment tendered an informal reception and smoker to their Commanding Officer, Col. E. M. Barnes, at which they presented him with an inscribed loving cup.

#### Suggestions

1. The system of operating a few large Camps for Medical Reserve officers ought to be continued, as it keeps up the spirit and morale and the wide and various contacts so made are highly beneficial.

2. The use of problems should be continued and amplified and Reserve Officers used as instructors in their various units, this work to be encouraged by giving selected men special opportunities to study special subjects.

3. A course of study on the same lines as that used by the Medical Regiment should be laid out for Evacuation, Surgical and other mobile and semi-mobile hos-

use his best efforts to see that the activities of the Reserve Corps are enlarged and broadened, and not curtailed by Congressional parsimony or self-interest and should exert himself to counteract the effects of the pacifist propaganda which is being carried on so actively.

6. Every able-bodied physician under fifty should hold a Reserve Commission; and all who hold them should go to camp every summer, if they are lucky enough to be able to get ordered there, for a splendid, two-week's vacation, *with pay*.

30 E. Huron St.

#### The Exploitation of Health

The prominence given to intercollegiate athletics, which annually is attacked and defended from physical, mental, and moral points of view, has been the outcome of the extension of higher education to a class not formerly reached, and the crowding of colleges with students who find in extracurricular activities an outlet for superfluous energy and a solace for compulsory school attendance. Every vigorous child has kinder recollections of his spontaneous playground activities than of his compulsory classroom exercises, and as the interests of college life sometimes seem to center more in the winning of intercollegiate games at all costs than in scholastic attainments, afterschool memories are chiefly of physical rather than mental athletics. Hence the exalted place of sports in the minds of the average alumnus.

This interest and the influence of the alumni have extended not only to their representation in the control of athletics, but to the introduction of graduate management. A few schools have helplessly allowed their athletics to be magnified out of all proportion and to be exploited by the alumni until it is difficult to say whether the schools manage the athletics or the athletics run the schools. It is little wonder that with such a state of affairs there is an annual crop of difficulties and criticisms. There is, however, a growing consciousness that the school should control these sports through its faculty and that they should be in charge of the department of physical education. The doing away with expensive coaching and gate receipts has also been advised as a means of a return to a normal state of affairs.

It has been pointed out many times that intercollegiate sports make use of rather than cultivate health and physique; and no matter what their value in the way of diversion the school has no business to foster them at the expense of the physical welfare of the general student body. There is more appreciation of this fact than formerly, as indicated by better provision for the physical education of the general student body, but many schools have far to go in this direction.

# The Heredity Factor in Mental Conditions

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No one interested in the cause of human betterment can fail to see, at times, the close correlation between defective heredity and physical or mental deterioration. Yet to accept the heredity basis as alone the causative factor in mental conditions especially, one must be able to see the parental deficiencies and then be able to trace them in their development and in their course in the offspring. But heredity is an important consideration everywhere because it is a natural phenomenon that points the way toward a goal in the direction of the elevation of the human race. Our racial and individual characters are transmitted in this way. From the eugenic standpoint we can maintain and build up higher racial stocks by banning admixtures that might have a tendency to attenuate them. From this standpoint even social scales and social conditions operate to influence human development. Nevertheless, it is freedom from acquired disease conditions, freedom from degenerating vices, favorable economic conditions, freer environment and positive hygienic measures especially, that are the specifics for raising the stamina of a people. Alien racial admixtures of themselves never attenuate—unless they are, perhaps, too wide and too heterogeneous for mixing at all, as is said to be the case when very widely divergent races attempt to mingle their blood. Otherwise, the contrary is more often the case. New blood acts to regenerate—blue blood to degenerate. In so far as the mingling of blood is concerned it is not unreasonable to hope that the better understanding of blood types and blood typing—as is carried out for transfusion—will supply a new angle on this whole matter. One encounters unmistakable evidences of the phenomenon of the transmission of human traits and characteristics in family mannerisms, social traits, occupational trends, habit tendencies and so on. Even here the influence of human associations and environment tends to discount their purely hereditary character.

In the causation of mental conditions, the heredity factor, with its numerous implications, is only one of the elements that it is necessary to dig out of the family and personal histories. It can throw a great deal of light on the general family character, their resistance to disease, their reaction under stress, the type of environment and living conditions to which they are accustomed. Prognostically, it helps to determine to how much stress it is safe to subject the rising members of the family; and from the standpoint of mental hygiene it serves to indicate the type of environment it may be necessary to reconstruct and to maintain for those who have been unable to weather the exactions of new environments. The well known tendencies of certain families to react the same way to outside influences are not so much evidences of a family heredity as they are evidences of the tendency of imposing on those with whom we are in close association of our personal traits and trends. In any event the question of heredity must be evaluated like everything else in the clinical picture.

However, in some interpretations of the case histories of such rather definitely classified mental disturbances as manic depression insanity, dementia praecox, paranoia, hysterical insanity and so on, there has been a tendency to urge that because almost all of them showed evidences in their family histories of defects of heredity,

defective heredity was the largest and only important factor in their causation. To be sure, not all of these defects were in the immediate ancestry. Many of them were found only in distant parts of the line, either in the direct or in the collateral. Percentage statistics have been compiled for every one of these tangible mental conditions. At best these figures can only be estimates—and most often the result of the usual precarious history taking. If the large percentages developed for each condition represented only parents or even siblings, they would perhaps be of greater significance, but they always include every evidence of defect not matter how indefinite, no matter how far back directly or wide apart collaterally. Nevertheless, it is far more important to understand, in the interest of general preventive measures and mental hygiene especially, that it is not hereditary defect so much as post-natal acquired morbidity, that composes the largest and most serious factor in mental as well as physical ills. So large an element in this acquired, preventable, morbidity that its exclusion from special consideration with respect to heredity, reduces all other factors, including heredity, to a relatively small number.

Even when the hereditary basis is accepted as the primary cause the relationship of cause and effect could only be scientifically established if the whole line, every member in it, were affected—as seems to be the case in the famous families of defectives, the Jukes and the Kalikaks, so often used as an illustration of this relationship. On the other hand, there are numberless instances of mental disturbances in individuals in whom not only can there be found no history of defect of heredity but where the stock, on the contrary, is found excellent. It is not a satisfactory explanation of this seeming paradox in heredity to maintain that the defective in an otherwise faultless line is a "throw back"—that somewhere in the genealogical tree, a heretofore regressive chromosome was dormant, to become dominant here. Nor is it quite satisfactory to explain the presence of an evident genius in an otherwise faulty line by the same reasoning, namely—that a heretofore dominant chromosome had been dormant in a defective parentage, to become actively dominant as the genius.

Except in heterogenous mixtures we are bound to assume a good mixture and good ancestral lines, if no tangible evidence to the contrary is unearthed, but who knows what really constitutes a desirable mixture? Dormant regressive elements may, perhaps be brought out by unfavorable mingling. Individuals alone, like chemicals, may be pure, but they may be incompatible when mixed—and result in very unsavory or even dangerous combinations. The determination of the conditions that affect stock mixtures, and activate unfavorable seed elements, is a most fascinating subject and can be even more fruitful to the student of heredity than the comparatively sterile observations and geometric delineations usually constructed to indicate mode of transmission. In addition, pathological, toxic and emotional disturbances in the mother during pregnancy, in so far as they disturb the orderly processes of development and the general well-being of the embryo, must receive prime consideration in the history. Prenatal emotional and mental influences, although at present still in the

field of pure romance, is not too unlikely an eventuality to be entirely overlooked in the broader interpretation of the scope of mental hygiene.

It is well recognized in medicine that, with the possible exception of syphilis, no disease is transmitted *in utero*. Diseases are acquired subsequently from the environment—from infection, from injury, from irritation, etc. Medical effort is directed to prevent and to eradicate them, without reference to heredity. And it is fortunate that this factor is not allowed to enter these lists else much valuable ammunition needed for the combat would be destroyed—and the fight against disease made so much more difficult. Yet when it comes to mental conditions and their origin the view seems, unfortunately, to be completely changed into an over anxiety to find a hereditary basis for them. When a gross mental or serious morbid condition is traced into the ancestry, it is straightway assumed, without much further consideration and without the apparent need for inquiry elsewhere, that there must be a definite relationship of cause and effect; and when no such evidence can be successfully traced it is nevertheless assumed to be existent but difficult to demonstrate. However, everywhere is evident, and it would be impossible to deny the baneful influence on posterity of alcohol, syphilis, epilepsy and gross morbid conditions in general. The precept that inculcates the need for health in the ancestry for the production of the best possible progeny, is as important now as ever before. Not so much in relation to the transmission of specific disease, as in the evolution of those more resistant to acquired conditions. Mental hygiene does not discount the existence of heredity factors in mental disturbances, but it discounts an ability to foretell its specific affects—and that they are an inevitable sequence. Indeed, there is no basis for the tenet that defects of heredity affect offspring in the same way or that they affect them at all,—otherwise it would be hopeless for one conscious of his defect of heredity and its implications to carry on thereafter. Even with the poorest heredity no traces may be found in the offspring, and, if present at all, only in an occasional one. Indeed, it is often a cause for marvelling, to those interested in case work, how some very defective parents can be responsible for such remarkable children. It is this very lack of inevitability of transmission that would seem to compel the conclusion that additional adverse factors must be injected to precipitate similar conditions in after generations. And it is in the environment that one must look for these prolific elements. Hereditary tendencies, if they exist, are the same tendencies that one speaks of in tuberculosis,—and they mean that life, under the same adverse environment under which the progenitors lived, is likely to effect the same disease conditions thereafter. It is with the change of environment, or with the resolution of its difficulties, that those interested in preventive measures in mental conditions are concerned. Not a great deal can be accomplished in the direction of mental hygiene when heredity and its influences are assumed to be so comprehensive that once a history of this condition is elicited elsewhere, it is sure to follow in the progeny; or, conversely, a mental condition once established in an offspring, it must be due to defects in the antecedents. It would also assume, necessarily, that, no matter how far back in the ancestral line a defect has been traced, the defect—not merely the tendencies or the potentialities,—must actually have existed *in esse* through all the generations,—conception, through embryonic life and into activity. Normal members of such a line would be doomed to pass on this "taint" even if

they themselves had miraculously escaped; and the biblical observation to that effect would indeed be established. Organic diseases of long standing do, however, reduce the vitality of the seed and lower stamina of the offspring, rather than specially affect the activities of the mind or the social behavior. Even vitality and stamina are not lowered irretrievably, for improved hygienic methods and measures are continually raising them until now we are succeeding by this "medical selection" what "natural selection" was supposed to effect when it had no competition. Nor is there any evidence of a specific selection in the viscera affected. Even in this respect heredity does not run true to form, otherwise it would be possible to prognosticate not only disease types but where they operate. Without selection of this kind there is no reason why a mentally diseased parent cannot translate his difficulty to an unrelated part of the body, and not in the nervous tissues where they would be expected to strike. This is again, perhaps, in the direction of making it clear why so many geniuses are born of mentally handicapped parentage. To be a definite and inevitable factor in the causation of mental conditions, heredity must carry out as certain a postulate as is demanded to establish the specific causation for germ infections.

As a further connection between the intangible defects of heredity and the mental difficulties in the offspring, certain psychotic expressions of the constitutional deficiency are presumed to permeate the individual, expressed in certain personal characteristics, and having a tendency to active mental difficulties under certain adverse influences of the environment. Or, if the offspring is already suffering from active disturbances, it has not been difficult to reconstruct from his history certain psychotic expressions of the constitutional defect as the proximate forerunners of the condition. These prepsychotic conditions are included under such nomenclatures as the constitutional psychopathic inferiorities, the psychopathic personalities, the praecox, the emotional instabilities and so on. Perhaps the prodromal symptoms in somatic affections could be considered clinical analogies except that prodromal symptoms are parts of one disease syndrome while the prepsychopathic conditions are different entities even though considered related. Clinically there are variations in personality having rather definite psycho-pathologic implications in social maladjustments, in behaviorisms, crime, alcoholism and so on. But the whole designation is so broad that there is no one who cannot be included somewhere. The importance of recognizing these variations as entitles lies in being able the better to understand differences in human behavior and for human reaction—and so the more effectively to combat difficulties confronting us. The unfavorable variations in personality are nothing else than the poorly defended broadsides that lend themselves more easily to attacks from within the environment.

More unsatisfactory than unusual personality variations as antecedents of mental difficulties, are the psychoses said to be provoked in those with defective heredity, by adolescence, by the puerperium, by the menopause and by old age. Ordinarily none of these physiological conditions would be expected to be productive of disease processes. There is no evidence to indicate that psychoses occurring at these periods of life can be provoked only in those with defects of heredity, and the association of disease processes with these periods is unsatisfactory as an etiological factor. Moreover, the nomenclature is even more unfortunate and betrays an ignorance of the underlying difficulties. It is understood that tissues in the process of rapid change, such as obtains at these periods, are likely to be more vulnerable



than at more stable periods in life. The likelihood of a large element of intoxication, because of involution of tissues, absorption and general turn-over, must not be left out of consideration. The recognition of the uncertainties of life during these periods have excited increasing interest in improving their environment and in special hygienic measures.

More advanced and more important to human welfare than academic studies in heredity, are the researches of mental hygiene into the nature and the sources of extrinsic psychogenic factors continually intruding themselves to the detriment of the organism. Mental hygiene, in its analytic aspects, is taking up the loose threads where the believers in a sort of fatalistic heredity have left them. But the psychoanalytic view of a "sex shock" occurring in early life, as a direct forerunner of mental disturbances in later life, must be accepted as a continual trauma coming from within even though not articulated to the consciousness. Otherwise, it would have no more merit than the view that a psychopathic personality, for example, is the direct forerunner of active psychopathy later on in life without any continuity between the two. The view that heredity defects and their prototypes can be such peculiar agencies in the causation of disease that no continuity of relationship need exist, is a novel one.

The large group of transitory psychoses usually classified under such headings as agitation psychoses, prison psychoses, situation psychoses and so on, form a very large part of the work with which the psychiatrist is confronted. They illustrate better than anything else the presence and the operation of psychogenic elements, temporary in nature, in their causation. There is usually a history of an unusual affront, and but rarely can a history of a defect of heredity be elicited. Cure is rapid and almost certain as soon as the offending pathogenesis is removed. These psychoses are the most prolific fields for the application of general and special mental hygienic measures.

In these conditions as well as in the large number of the other psychoses, the number who are permanently cured is not only a most hopeful outlook in general, an encouragement in the field of psychiatry and mental hygiene but also a refutation of the basic nature of the hereditary factor. Complete recovery can never be presumed unless the causative agencies are removed, their effectiveness attenuated, as in the self-limiting diseases, or where curative efforts have restored tissues as well as destroyed offending agencies. Heredity, as an offending agency, cannot of course be removed. Nor can the tissues be restored to a condition unaffected by the hazards of their pathologic heredity. Of course, even with heredity as a cause, abeyance of symptoms and amelioration of disease processes, can be expected; and in so far as the psychiatrist and the mental hygienist are concerned this is a most opportune time for preventing further reactivation, regardless of the question of the etiological factor involved.

In the transitory mental disturbances especially, the whole clinical picture looks like an exaggeration and a lengthening of the normal emotional reactions, under the influence of undue stress rather than because of the operation of heredity defects. These disturbances are not the results of basic immutable changes, waiting only for more knowledge to draft them into the realm of the classified and, therefore, hereditary mental conditions. When recurrences do infrequently happen they are due to repetitions of the same agencies that operated in the initial attacks and are not proof, because of these recurrences, of their hereditary nature.

Scientific basis or rationale are lacking for the view that even undue stresses or shocks, that break down men-

tal and emotional stability, can never do so except in those who are already degenerated constitutionally by heredity. A stress hard enough or sudden enough, can be understood that would break down any being no matter how perfect the heredity or how strong the constitution. On the contrary, refinement of constitution, sensitivity of nervous tissues and of responsive emotions are evidences of the trend of upward development. The crude and the unrefined are not so sensitive to stress or shock. It takes an inordinate amount to make them sensible even of physical injury. The emotionally unstable—understanding that condition to be an evidence of a lower state of human development, and of constitutional and perhaps hereditary origin—do not become mentally disturbed as a result of undue stress. They are much more likely to react to such stresses in a behavioristic manner,—in an inability to attune themselves to the exacting demands of the social and environmental symphony.

Immunity to the effects of mental stresses in those with favorable heredity is as little likely as immunity to germ infections. The virulence of the infecting agency, or the depth of the mental stress, determine morbidity in any case. All hygienic endeavors aim to shield the individual from the sources of infection, strengthen him immunity by artificial measures and, with mental hygiene, remove the individual from the type of environment to which he seems unduly sensitive,—and otherwise to fortify him against the adversities of the environment he must combat.

It is, then, his vulnerability, rather than his immunity, that is increased by the great variability of emotions with which human beings are increasingly being endowed. Civilization with its urban life has immensely multiplied the ways, refined the means and drawn out the degrees by which an individual and his emotions can be subjected to outside trauma. So much is this the case that it would hardly be an exaggeration to say that mental, but particularly emotional, disturbances should be the rule rather than the exceptions that they really are. The potentialities for mental and emotional disturbances are as present in all of us as are the susceptibilities to somatic disturbances. Ample justification for great anger, much worry and profound grief may be present in all of us. They may be so great and the results so deep and lasting as to shut out all other considerations from the mind, become a veritable fixed idea and, thus, a psychosis. It becomes a question how far can one forget himself in anger, neglect himself in grief or lose the sense of proportion in worry, and still not be considered a sufferer from a tangible psychosis—and not be saddled with the implications of a defective heredity?

Special variations in personal character with which an individual must face life, affect his reactions to his environment. Some of these characteristics are considered, from a social or from an ethical standpoint, to be favorable, while others, from the same standpoints, are considered unfavorable. Their values are, of course, not fixed. They may depend upon the social stage or the social circle in which the individual lives and moves—and they are, of course, forever changing. It is difficult to say whether these individual characteristics are entirely hereditary, but to be certain that the unfavorable ones are due to defects of heredity is not consistent, particularly because the ethical conceptions of races in general and people in particular are forever undergoing radical changes. Moreover, they all have a very strong emotional background, so that an individual's whole character may change under appropriate pressure; and it is by playing on this strong emotional element that un-

(Continued on page 243)

IV.

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## Urology for the General Practitioner

### IV. Gonococcal Infection In Its Relation with Bastardy:—A Social Problem Study With Case Report.

VICTOR COX PEDERSEN, A.M., M.D., F.A.C.S.  
New York.

The following case is worthy of publication on account of the medicolegal questions involved. It was brought to me through one of the social welfare societies such as have commanded my interest and cooperation for many years. It involves the question of fatherhood out of wedlock and turns on the question of active venereal disease beginning about three months before the sexual contact.

The report of the social agency is that the girl came of unusually good family, was aged nineteen years, and admitted sexual relations with a young man twenty-two years old on March 30th, 1926. Her family fully corroborated her story in these details. She was carefully examined in my office on November 2nd, 1926, and found to be without venereal disease and about seven months pregnant. The child was born in one of our large hospitals on December 28th, 1926. A thorough examination at the hospital confirmed the absence of venereal disease. The convalescence was straightforward and uneventful. This fact only adds additional proof of the absence of venereal disease in the girl, because the puerperium above all others is the time when gonococcal infection spreads most rapidly and extensively.

The bastardy trial was held in the Chambers of the Children's Court in one of the large suburban towns in a neighboring county. The initial defense of the youth was that he had become infected with gonorrhea in January, 1926, still suffered in March from obvious discharge and therefore could not have had contact with her without infecting her, and because of his disease he could not have impregnated her. This defense was corroborated, if not instituted, by his family physician, who unfortunately kept no records of the case and did not follow the custom proper among urologists of frequent microscopical examinations and records thereof. At this first hearing it seemed that the case would be decided in favor of the young man, but the field worker of the social agency obtained a postponement of decision under the plea that she wished to confer with me.

After obtaining a careful account of the case from her, I wrote the following opinion, respectfully addressed to the Judge sitting in the Court at that time:

"The Honorable .....  
Justice of the Children's Court,  
.....County,  
New York.

Dear Sir:

Mrs. ...., Secretary of the .....  
has been in conference with me as to the defense entered in this case on the point that the boy could not impregnate the girl because of certain treatment for gonococcal infection and that he could not have intercourse with her without infecting her.

"1. Unless the physician of the boy can show that he subjected the discharge of the disease to frequent microscopical examinations he knows nothing whatever about the infectiousness which is the chief element. For example, recent studies have shown the abolition of infection in two days of treatment as the shortest time in a few cases and nineteen days as the average time in one hundred cases making up the study due to the employment of one of the new antiseptics.

"In comparison with the probable absence of examinations by the boy's physician, this study involves daily or nearly daily observation with the microscope.

From these facts the conclusion is more than reasonable that unless the doctor can prove absolute infectiousness well into the month of March, he may perfectly well have abolished infection although a catarrhal discharge continues as a general rule in the cases for a few or many weeks.

"2. The existence of venereal disease does not abolish the secretion of semen by the male nor does it necessarily affect sexual passion in the male. Quite to the contrary a standard element of advice is to control sexual passion to the uttermost during disease. For example, the indirect excitement without gratification arising from petting parties is always forbidden in both sexes in the midst of disease. Desire is often overstimulated during the later noninfectious stages.

"3. From these two facts two things follow: the boy, provided he was infectious, could hardly have had intercourse without infecting the girl, but this proviso is open to every reasonable doubt in favor of the girl unless the doctor can prove the infection by record or known microscopical tests.

"The boy while in the catarrhal recovery stage could perfectly well fertilize the young woman without involving her in any way except the pregnancy. I have never heard of a claim which seems to me so ridiculous as that which Mrs. .... reports, namely that the doctor states that treatment of gonococcal infection as such temporarily unsexes the male for fertilization.

"If a general opinion from me is permissible, it would be that the entire defense is so topheavy with remote claims that it is against public policy to permit it to stand. In other words, it opens the door for practically every unmarried father to claim venereal disease and thus go Scot-free.

"In order to stand such a defense should rest on every possible and absolute scientific proof which seems, in this case as far as I know it, by no means to be the fact.

"Another point in public policy, in my best judgment, is the question: Shall the man acknowledge as his defense proof of moral turpitude in treatment of venereal disease in his effort to escape his moral responsibility for another moral turpitude, namely fatherhood out of wedlock? In a case in New Jersey involving annulment of marriage, the judge instantly declared the man incriminated himself by an admission of promiscuous intercourse even without venereal disease. Although the cases are not parallel, I think the reasoning is sound that public policy should not permit a man to confess himself a consort of prostitutes and venereally infected in order to defend himself against other charges.

"There is still another aspect which, in my opinion, goes still further in degrading the young man. Assuming, as is probably the fact, that he did have venereal disease in January, 1926, and that its infectiousness had been abolished without the doctor having proved it to his own satisfaction and to the knowledge of the patient, and assuming that its catarrhal sequel had not been abolished, the boy had more or less discharge which,

in his mind, would still be venereal and infectious disease, nevertheless he was willing to submit a perfectly decent girl to two risks of intercourse with him—first, impregnation, and second, infection. Again I believe it to be against public policy to permit any such defense as his to have any real, worthwhile standing in court.

"Yours very truly,

"V. C. PEDERSEN."

I also marked and sent to the Judge a copy of the study from the Venereal Disease Clinic of the Bureau of Preventable Diseases, Department of Health, City of New York, entitled, "Acute Gonorrhea, A Comparative Study of Cases Treated with Mercurochrome and Protargol, by Louis Chargin, M.D., Walter Seckel, M.D., and Abraham Stone, M.D.,<sup>1</sup>

Among a hundred cases studied this report shows that with mercurochrome the shortest actual time to become aseptic was two days, the longest seventy-five days, and the average nineteen days; and further that with protargol, the shortest time was four days, the longest fifty-six days and the average eighteen days. These observations were based on daily or nearly daily microscopic reports, and records—all in strange contrast with the physician in charge of the young man, who kept no records and did not make very frequent smear tests. These data establish beyond reasonable doubt, the fact that before March 30th the infection in the boy had been abolished. The evidence shows that the physician used both mercurochrome and protargol.

The case was decided against the boy and the following letter from the Judge, while not a formally written opinion, is important and interesting.

It will be noted that my statement was written so as to be final, inclusive and conclusive—all as far as possible. Several letters passed between the Social Agency and the Judge on the one hand and myself on the other, of which the following are germane, important and interesting, as bearing on and discussing the main points of the case as I saw them.

"My Dear Dr. Pedersen:

"I have your recent letter with respect to your sending to the Journal of the ..... a report on the interesting case of ..... against ..... which was heard in this Court. Not only because I feel indebted to you for the assistance which you rendered to me, but because it presents a case which the legal and medical fraternities might be interested in, I feel free in giving you my hearty approval in using such data as I may be able to furnish.

"This case was decided at the time of the trial and no written opinion or decision was prepared by me. At the defendant's first hearing it developed that a child was born to the girl during the month of December, the allegation being that the sex contact took place on March 30, 1926. The defendant in the course of his complete denials testified that for some months prior to the date of the alleged contact and some months subsequent thereto he was under treatment for acute gonorrhea. The child was born in a Hospital and there was at no time a history of gonorrhea with respect to the mother. It was therefore argued by the defendant that under these circumstances it was impossible for him to have been the father of the child in question. In addition to this his attending physician testified that the infection was of such severity during the last part of March that he questioned whether it was possible for his client to have had sexual intercourse at all. The Doctor further testified that if there had been sexual intercourse between the parties concerned in this litigation on March

30, the girl would have been infected with such disease.

"On the defendant's second hearing Dr. .... of ..... Hospital, (..... County Hospital) called as an expert by the Court testified that it would be possible for the parties in question to have sexual intercourse on March 30 or any other time with a slight chance of no infection being conveyed. And that further it was wholly possible for the man to have been able to commit an act of sexual intercourse. On my further examination of the attending physician of the man I questioned him with respect to his treatment. I discussed the treatment with mercurochrome and protargol and the subsequent effects. It was developed then that it was very probable that a treatment with these agencies a short time prior to the sexual contact could have resulted in the consummation of the intercourse without a transmission of the infection. The physician finally also testified that a transmission of the disease was not a matter of certainty.

"There was some further testimony with relation to the question as to whether or not the patient was suffering with anterior or anteroposterior urethritis.

"Finally, bearing in mind the excellent character and reputation of the girl, and the manner and method of her testifying and giving personal heed to the general personal equation I convicted the defendant of the charge. I held that it was possible for the act of sexual intercourse to have taken place, that it actually was consummated, and that—although the defendant was suffering from virulent gonorrhea at the time—there was no transmission of the disease. No appeal has been taken.

"I want you to know that I appreciate most sincerely your active interest in this case and want to assure you that if I can be of any further service to you—even so far as to furnishing you the minutes of the hearing I shall be more than glad to do so.

"Assuring you again of my appreciation and with best wishes,

"Sincerely yours,

"P. S. I forgot to add the attending physician testified that he had used mercurochrome and protargol."

This admirable letter left unanswered only the questions of public policy and public morality of a venereal disease defense, covered by my extended communication.

The reason I so desired the final opinion of the Judge on these points is set forth in one part of my letter to which the next preceding letter is his answer:

".....The reason I would like your comment on these thoughts is that in a luncheon discussion with an attorney, he was reasonably positive in his disagreement with the points, as I made them. On the other hand, however, the chief meaning of these paragraphs is for the medical profession as such. Ethics in any profession have been defined as common sense in the matters of tact and taste toward the community as a whole, and toward individual citizens. I cannot escape the conviction that the physician who goes into court to back up such a defense without having satisfied every step in the diagnosis and record thereof, is guilty indeed as to the proper respect for ethics in the foregoing sense. Whereas no medical society would try and reprove him, nevertheless I feel that subconsciously the best elements of such a society would not approve of his conduct...."

The next letter from the Judge is fully responsive and final:

"My Dear Dr. Pedersen:

"Will you not please pardon me for not heretofore replying to your last communication? I have been so

(Concluded on page 243)

<sup>1</sup> L. I. Med. J., July, 1926.

# Endocarditis and Meningitis (Pneumococcic)

## Report of Cases and Review of Literature

HYMAN I. GOLDSTEIN, M.D.

Camden, New Jersey

ADJUNCT ATTENDING PHYSICIAN AND CHIEF OF THE MEDICAL DIAGNOSTIC CLINIC, MOUNT SINAI HOSPITAL, PHILADELPHIA; ASSISTANT VISITING PHYSICIAN, PHILADELPHIA GENERAL HOSPITAL; ASSISTANT VISITING PHYSICIAN AND CHIEF OF MEDICAL CLINIC, NORTHWESTERN GENERAL HOSPITAL, PHILA.,

and

HENRY ZUCKERMAN GOLDSTEIN, M.D.

RESIDENT PHYSICIAN, MOUNT SINAI HOSPITAL,

New York City

(Continued from page 208, September issue)

**Case VIII.—Pneumococcic (Type I) Vegetative Mitral Endocarditis.**—Alexander G. Admitted October 17, 1925 (Philadelphia General Hospital). Died November 16, 1925.

**Diagnosis.**—Lobar pneumonia; acute bacterial endocarditis. Service of Dr. L. N. Boston, Chief. Drs. H. I. Goldstein and A. E. Blackburn, Asst. Chiefs. Adult male, colored; aged 39 years. Occupation, laborer.

**Chief Complaint.**—Shortness of breath. Duration 24 hours.

**History Present Illness.**—Patient had had a cold with an unproductive cough for two weeks, and had not been working. Last night he developed a severe pain in his right chest, made worse by deep breathing and extreme shortness of breath. Since then he has been coughing up a small amount of yellowish thick sputum. He says he has had a fever for the past two weeks, but has not taken his temperature.

**Family History.**—Wife living and well. No children alive. Two children dead, cause unknown. One miscarriage. No history of tuberculosis, cancer, diabetes, heart, kidney or mental disease obtainable.

**Past Medical History.**—No operation or injuries. Denies venereal disease. No measles, scarlet, typhoid, diphtheria, pneumonia or influenza. No loss of weight.

**Systems: Gastro Intestina.**—No vomiting. Bowels have not moved for three days. Appetite poor. No bloody stool.

**Respiratory.**—No night sweats or hemoptysis.

**Cardiovascular.**—No swelling of feet, palpitation or precordial pain. No dyspnoea until present attack.

**Genito-Urinary.**—No nocturia or hematuria or dysuria.

**Physical Examination: General Appearance.**—The patient is a fairly well developed negro male about thirty years of age lying quietly in bed, breathing somewhat rapidly, coughing occasionally and appearing acutely ill.

**Head.**—No masses, scar or mastoid tenderness.

**Eyes.**—Pupils dilated, equal, regular, react to light and accommodation.

**Nose.**—No obstruction, perforation or discharge.

**Ears.**—No discharge or tophe.

**Mouth—Breath fetid.** Teeth carious. Pharynx somewhat injected.

**Neck.**—No stiffness. No enlargement of thyroid.

**Chest.**—Well developed. Expansion limited on right side.

**Lungs.**—Over right upper lobe anteriorly there are dullness, bronchial breathing, small moist rales and increased fremitus. Posteriorly on the right side there is dullness throughout with increased fremitus, moist rales and rhonchi. Breath sounds bronchial over upper lobe. On the left posteriorly, resonance is also some-

what impaired throughout and rhonchi (?) which cause palpable vibrations are also heard.

**Heart.**—Apex in 5th space one inch outside nipple line. Action rapid but regular. Sounds good quality. No murmurs. Blood pressure 105/70.

**Abdomen.**—Distended. Tenderness in right upper quadrant. Liver, spleen and kidneys not palpable. No scars or masses.

**Extremities.**—No edema. Knee jerks not obtained.

**Diagnosis.**—Lobar pneumonia, right upper lobe. Bronchitis. (Hill).

October 20, 1925—To-day patient has developed an acute arthritis of left elbow. Joint is swollen, hot and tender. Blood culture ordered.

October 24, 1925—Left chest shows increased fremitus and many large and small moist rales throughout. There are also a few small moist rales at right base. Temperature is now subnormal. Left elbow is very swollen, hot and endematous. Abdomen considerably distended. Herpes on lips. Blood culture reported positive for type I pneumococcus. Left elbow was aspirated but no pus was obtained from joint, although a few drops could be squeezed out of skin puncture.

October 26, 1925—Swelling has gone down considerably in elbow and it is less tender. Patient feels and looks much better than he did on the 24th.

October 30, 1925—Rales have practically disappeared from chest. Temperature is down almost to normal. Elbow swelling is much improved. Patient coughs very little if any and says he feels pretty well. Transfer to Medical Ward 335.

November 4, 1925—Patient had a chill this A. M. about 9:15 o'clock. He looks thin, weak, and anemic. Right base of lung is still dull on percussion and breath sounds are weak there. Moist crackling rales also heard. The spines seem clear. There is a possibility of tuberculosis in view of the irregular and atypical temperature during the supposed lobar pneumonia and in view of his slow convalescence at present. Temperature, pulse and respiration are practically normal.

November 6, 1925—Patient asks to sit up. Pulse seems soft and easily compressible. Blood pressure 110/60. Still has some rales on inspiration in right lower chest near costal margin. Temperature around 100 to-day and yesterday. Says he feels all right. Has had no bowel movement to-day or yesterday.

November 8, 1925—Had another chill to-night about 8 o'clock. Temperature at the time was 100.4 what it had been all day. Body felt hot. Has no complaints. Will aspirate chest to-morrow.

November 9, 1925—Chest not aspirated because no



definite area of dullness found and breath sounds came through diminished but present.

November 12, 1925—Was called to patient at 5 o'clock this A. M. because of a sudden change in condition. He was found covered in a profuse sweat, almost stertorous breathing and could not be aroused. Both eyes deviated outward but especially the left. Spleen found enlarged about one inch below costal margin. Liver could not be felt. Only the first sound could be heard over the heart and that was accompanied by a systolic murmur which he has had for almost a week. A few rales and decreased breath sounds in lower right chest which he has had for almost a week. Biceps, triceps reflexes normal and equal. Patellar reflexes apparently subnormal. Achilles reflexes normal. No paralysis. No Kernig. Questionable Babinskis both sides. Ankle clonus right side questionable. No petechial spots in lower eyelid. Impression: Acute bacterial endocarditis.

November 14, 1925—Patient is still unconscious. Becoming more dehydrated. No incontinence of urine. Shows some irritability of eyes when touched. Heart tones are regular and of fair quality. Just a question of time.

November 15, 1925—About 18 c.c. of anti-pneumococcic serum type I were given intravenously. There was a reaction within two hours of a rise of 2 degrees in temperature. Patient had received 1000 c.c. of normal saline by hypodermoclysis earlier in the day.

November 16, 1925—*Final Note*—Patient died at 6:50 A. M.

*Final Diagnosis*—Lobar pneumonia (convalescent). Acute bacterial endocarditis.

*X-ray Report* No. 30234, taken November 5, 1925—There is no evidence of consolidation or of fluid. The lung fields appear normally translucent.

*Laboratory Record*—Urine analysis, 10/19/25—Amber acid; 1018; light cloud of alb.; hyaline cases 4-5 low p. f.; granular casts 5-10 l. p. f.; mucus (2 plus) epithelial cells—few squamous.

November 4, 1925—Straw; acid; 1010; alb. 0; sugar 0; some mucous; few epithelial cells.

November 11, 1925—Straw; alk. 1010; alb. ft. trace; sugar 0; crystal amor. urates.

*Blood*—October 17, 1925—W. B. C. 11,100; Polys. 78 per cent; lymphos. 12 per cent; H. & Trans. 10 per cent.

November 6, 1925—R. B. C. 3,730,000; W. B. C. 11,900; Hgb. 7.2; polys. 75 per cent. .25 per cent.

October 20, 1925—*Blood culture*—Pneumococcus type I.

October 27, 1925—*Wassermann*—negative-chol. and neguchi.

November 11, 1925—*Malaria*—no plasmodia found.

November 9, 1925—*Culture*—pneumococcus type I.

October 24, 1925—*Tubercle bacilli*—none found.

November 10, 1925—*Smear for malaria*—no malarial organisms found.

November 9, 1925—*Smear for tubercle bacilli*—none found.

*Autopsy No. 10,273*, performed on the body of Alexander G. eight (8) hours after death, by Doctor Bucher. Admitted July 10, 1925; died November 16, 1925.

*Clinical Diagnosis*—Lobar pneumonia. Acute bacterial endocarditis.

*Bacteriological Diagnosis*—Heart—blood, pneumococcus, type I, staph. albus.

*Gross Anatomical Diagnosis*—

*Heart*—Acute vegetative endocarditis.

*Lungs*—Resolving lobar pneumonia.

*Spleen*—Acute splenic tumor.

*Kidney*—Congestion and degenerative changes.

*Liver*—Cicatix (probably syphilitic).

*Brain*—Very slight congestion or cortical arterioles.

*Histological Diagnosis*—

*Heart*—Acute fibrinous endocarditis, mitral. Acute parenchymatous degeneration.

*Lungs*—Acute fibrinous pleurisy; chronic fibrinous pleurisy; partial atelectasis.

*Spleen*—Congestion.

*Liver*—Fibrous scar.

*Brain*—Multiple areas of softening and organization (embolic).

*Pancreas*—Five light fibrosis.

*Adrenal*—Congestion.

*Cause of Death*—Acute vegetative endocarditis, mitral; Cerebral multiple areas of softening.

*External Examination*—Body is that of a young adult colored male of slight muscular and bony frame. There is not much rigor mortis or not much lividity of death. The body is still warm. The lips are dry and scaly.

*Internal Examination*—The muscles are thin, red and flabby. There is a slight amount of fat. There are some recent adhesions of the right lung to the pleura. At the apex laterally and at the base on the right side there are some adhesions on the right side of the liver anteriorly to the diaphragm. The appendix is in the retrocecal fossa and is not bound down by adhesions. The pleural cavities and pericardial sac and peritoneal cavity do not show an excess of fluid.

*Heart*—Weights 400 gm. and measures 15 x 11 E 5.5 cmc. It is pale in color with a slight amount of fat and is somewhat flabby. There is some dilatation of the right auricle. The tricuspid valve and pulmonary valve do not show any pathology. The endocardium is smooth and glistening and there are no areas of infection or other pathological changes. In the left heart the anterior leaflet on the mitral valve has a number of heaped up vegetations which are dull, granular, irregular, gray and green masses about the size of an English walnut. The posterior valve leaflet has a little of this at its margin. The rest of the leaflet is intact. The aortic valve leaflets show no special change. The coronary vessels do not show any thrombi.

*Left Lung*—Weights 610 gms. The organ is purplish in color. The lower lobe is some congested.

*Right lung*—Weights 650 gms. The lower lobe shows some congestion and a certain degree of firmness. It seems to contain less air than the usual lung tissue and appears to be a late stage in the resolution of a pneumonia.

*Spleen*—Weights 280 gms. and measures 14 by 10.5 by 4 cms. The capsule is deep red in color and presents a number of fibrous tissue thickening which are gray white in color. The organ is flabby, it cuts with ease and the cut surface bulges. It is soft and dull red in color.

*Left kidney*—Weights 180 gms. and measures 12 by 6.5 by 4 cms. The capsule strips with some difficulty. The surface of the kidney shows a number of markings which agree with the appearance of a fetal kidney. The organ cuts with the slight resistance. The cut surface shows some swelling of the parenchyma although the normal relation between the cortex and medulla are maintained. The cut surface is gray in color and the blood vessels between these gray strips are injected and stand out prominently. On the cut surface there are a number of small grayish yellow areas which are dull in reflected light. The pelvis shows a slight increase in the amount of fat.

*Right kidney*—Weights 160 gms. and measures 11 by



5.5 by 4 cms. It is not unlike its fellow in general description.

**Liver**—Weights 780 gms. and measures 29 by 19 by 11 cms. Its color is tan. It is fairly firm and on the anterior surface of the right lobe it presents a large stellate scar which dips down into the liver surface and is about the size of a silver dollar. From this scarred area connective tissue bands stretch out to be attached to the diaphragm. On section the liver is pale tan in color, somewhat dull and around the lobules there seems to be some slight infection.

**Stomach and Intestines**—Do not show any gross changes.

**Pancreas**—Shows nothing of special interest.

**Bladder**—Mucosa is normal in color and shows no pathological change. Section from heart, the vegetations from the valve leaflet and the muscle of the lower lobe of the right lung, both kidneys, spleen, liver, pancreas and adrenals.

**Brain**—Weights 1250 gms.

**Histology**—(see above).

**Neuropathology**—(Dr. Winkleman).

**Gross Description**—Brain weight 1250 gms.

The specimen is of normal size and consistency. The pia arachnoid in appearance is normal. The convolutions in this case appeared to be numerous and smaller than usually seen. There was no edema. The vessels at the base were neither thickened nor tortuous, the walls were white. The finer arterioles of the convex cerebral surface were slightly injected. The brain was sectioned vertically from front to rear, no abnormality was made out. The cerebellum and pons were not abnormal.

**Sections**—Placed in 80 per cent alcohol and formal bromide.

**Gross Diagnosis**—Very slight congestion of the cortical arterioles.

**Microscopic Description**—January 6, 1926—

The pia arachnoid but slightly fibrotic and contains a few abnormal cell elements that are for the most part phagocytic cells. The cortex, in the main, is well preserved but throughout the entire cortex are areas where the normal structures has entirely disappeared. Some of the foci are recent and show replacements by glitter cells and glial tissue and collections of polynuclears, in others more advanced there is organization with vacularization and glial proliferation. The basal vessels are for the most part normal.

**Microscopic Diagnosis**—Multiple areas of softening and organization (embolic).

**Case IX.—Pneumococcic Meningitis**—James E. S., Philadelphia General Hospital. Service of Dr. L. N. Boston, Chief; Drs. A. E. Blackburn, H. I. Goldstein, Asst. Chiefs; Dr. P. T. Martin, Interne. Admitted November 19, 1925; died November 20, 1925.

**Diagnosis**—Pneumococcic meningitis. Patient sent in by Police Surgeon, Dr. H. I. Antrum with the following history: Patient a white male, aged 26 years, born in Phila.; married.

Became uncontrollable and violent. Had hallucinations and delusions, extreme nervous symptoms. Relatives request hospitalization. Recommend observation.

November 19, 1925—Admission note:

Patient was admitted to ward about 10:30 a. m. in a semi-comatose condition but could be aroused at times to answer questions. His answers were, however, not entirely reliable as his mental state was not entirely clear.

Says he has had backache down over the kidneys for about three weeks. Has not had pneumonia within the past year.

Last Saturday (5 days ago) he fell ill and went to bed. Tried to work Monday but was forced to stop. Tuesday he had a severe headache and a chill. After this he had fever and a pain in the back of his neck which has continued up until time of admission. Also has an aching across his shoulders.

When questioned about his semi-comatose condition he is not able to explain saying he was knocked down by an automobile last Saturday (5 days ago). However, there are no signs of trauma anywhere over scalp and body.

He was brought in by police patrol with a note saying he was violent, uncontrollable, hallucinated, etc., at home and his people wished him to be brought to hospital.

**Physical Examination**—

**General**—A young white man semi-comatose groaning with almost every breath and with a definite strabismus.

**Head**—Face is of a red cyanosed hue and is dirty. No signs of trauma. Scalp shows no signs of trauma. Internal strabismus with inequality of pupils, the right being smaller than the left. Both react fairly well to light and accommodation. Tongue dry, coated and furred. Throat reddened and posterior pharynx very dry, red and covered with grayish mucoid material. Lips—cyanotic. Teeth fair shape.

**Thorax**—Good contour. Resonant throughout on percussion. Breath sounds a little distant. No murmurs.

**Heart and Circulation**—Apex beat not visible or palpable. Sounds regular but distant. No murmurs. Pulses accelerated by synchronous and regular.

**Abdomen**—Good contour. Liver and spleen not palpable. No masses or tenderness. Tache-cerebrale definitely brought out.

**Extremities**—No signs of trauma. No scars, no paralysis, no edema.

**Neurological Examination**—

**Eyes**—Internal strabismus. No nystagmus. Right pupil smaller than left.

**Motor**—No paralysis evident; some stiffness of neck.

**Reflexes**—Biceps and triceps present but diminished. Both patellar reflexes lost. Both achilles lost. Abdominal present and equal. Babinski present both feet. Kernig's present, both legs. No ankle clonus.

**Diagnosis—Meningitis.**

Spinal puncture done and about 25 c.c. of purulent fluid removed under pressure. Examination showed gram-positive diplococci intra and extra-cellular.

**Diagnosis—Pneumococcic meningitis.**

About 20 c.c. of anti-meningococcic serum given intraspinally 4 p. m.

November 20, 1925—**Final Note**—

Patient died at 2:45 a. m. Diagnosis as above.

Case reported to Coroner.

**Laboratory Record**—No urine analysis made.

**Blood**—(November 19, 1925)—R.B.C. 4,544,000; W.B.C. 9,700; Hgb. 13.2 gr.; Polys. 72; Lymphos. 22; L. & Trans. 6. Blood Sugar—12.9; Urea—16; Uric acid—3.6.

**Case X.—Pneumococcus (Group IV) Meningitis and Acute Vegetative Endocarditis**—Mrs. Emily B., white, seamstress, aged 53, Philadelphia General Hospital, Women's Medical, Ward 214, Service L. N. Boston, Chief; A. E. Blackburn and H. I. Goldstein, Assistant Chiefs; A. Gonzales, Interne. Admitted: April 2, 1923. Died: April 13, 1923, at 4:25 p. m.

**Chief Complainant**—"Pain on the chest and weakness."

**H.P.I.**—Patient is very stuporous so history is very incomplete. She has been ill for eight to ten weeks but could manage to go to her work. Last Monday she was

much worse. Got up from bed and took a severe chill. She had to stay up to take care of herself and cook her meals. She had "pains on her chest" and felt very ill. Somebody used a black salve on her chest which did some good. Did not vomit, but had headache. As her condition was getting worse, she decided to come to the Philadelphia General Hospital.

**P.H.H.**—Had diseases of childhood. According to old records, she has been five times in the Philadelphia General Hospital, with mitral disease and alcoholism. Never been operated on. Had no accidents.

**Social History**—Has been married four times. Dress-maker. Used liquor freely, habits very irregular. Never used drugs. Her physical condition was very poor lately. Has two children, living and well. One child died of tuberculosis of the bowels. Family history—negative. No T. B., no epilepsy.

**Physical Examination**—Fairly well developed female of about 55 years. She looks very sick and dyspnoeic, semi-stuporous.

**Head**—Grossly normal. The hair is beginning to get gray.

**Face**—Pale with a malar flush. The lips are dry—looks like pneumonia.

**Eyes**—No palsies—ocular movements are full and equal. No nystagmus. Pupils are rounded, regular, equal and react to I. and a.

**Nose and Ears**—Grossly negative.

**Mouth**—The lips are dry—tongue coated. Many teeth are missing, remaining teeth are in poor condition. Throat is clear.

**Neck**—No adenopathy. No enlargement of thyroid. Slight engorgement and pulsation of veins of neck.

**Chest**—Normally developed. No masses. Breasts are normal.

**Lungs**—Expansion is decreased on the left side. Tactile fremitus is increased in this side. There are no rales, but many on the right side. There is dullness to percussion, but the breath sounds come through slightly. Voice sounds are decreased on the left. No whispered pectoriloquy. There is a patch of bronchial breathing low down posteriorly on the left side.

**Heart**—The organ is enlarged. Apex beat seems pushed to the right, but is diffuse. The sounds are regular and of poor muscle tone. There is a double murmur heard all over, but best at the apex.

**Abdomen**—Soft and slightly tympanitic. There is no tenderness. No masses. No scars. The internal organs are not enlarged to palpation.

**Genitals**—Externally are normal.

**Back**—No masses or curvatures.

**Extremities**—Well developed. Reflexes are normal. No Babinski or clonus. No Kernig.

**Diagnosis**—1. Left massive pneumonia with pleurisy. 2. Mitral Disease. Pericardial effusion. 3. Chronic Myocarditis. 4. Tympanites. (Dr. A. Gonzales).

April 4, 1923—Patient seen by Dr. A. E. Blackburn who thinks it is a case of lobar pneumonia with plastic pleurisy which would explain some of the findings. Patient does not show any changes.

**Blood Pressure**—130

75

April 5, 1923—Patient feels better.

April 6, 1923—Dr. L. N. Boston thinks there may be a beginning pericarditis, as there is a slight friction rub at margin of heart on left.

April 7, 1923—Patient seems improved. There is some air going through the lungs now.

April 8, 1925—No change.

April 9, 1923—No change.

April 10, 1923—Temperature is up and patient looks much worse.

April 11, 1923—Patient is semi-delirious, and T. P. R. are up. Patient is worse. Dr. H. I. Goldstein thinks patient is developing meningitis, in addition to the endocarditis and pneumonia.

April 12, 1923—Patient continues to be delirious. She persists in remaining in one position with legs drawn and turned to one side.

**Neurological Examination**—There is no paralysis of the cranial nerves. The pupils are dilated. Right one is slightly larger than left. Both react to light. Neck is stiff and there is a clear Brudzinski present. The arm reflexes seem normal. Patellar reflexes are very weak but present. Achilles could not be obtained. There is a positive bilateral Kernig sign and positive contralateral reflex. No Babinski. No ankle clonus.

**Diagnosis**—Meningitis.

April 12, 1923—(p. m.) Spinal puncture done. Fluid turbid and under pressure. About 20 c. c. withdrawn for study.

April 13, 1923—Patient is very weak this a. m. The respirations are rapid and shallow. Spinal puncture repeated. Fluid whitish opaque. Slightly increased pressure. About 30 c. c. removed by Dr. Gonzales.

April 13, 1923—Patient seen by Doctors Boston, Goldstein and Blackburn—who think the case is one of pneumococcal meningitis.

April 13, 1923—(4:25 p. m.)—Patient died of cardio-respiratory failure. (At 4 p. m. temperature rose to 106.5, then 107, pulse 140.)

**Diagnosis**—Massive left pneumonia. Pneumococcal meningitis. Mitral disease. Chronic myocarditis. Alcoholism.

**Laboratory Reports**—April 8, 1923: **Urine Analysis**—Dark amber. No sediment. Acid. S. G. 1.025. No sugar. Light cloud albumin. Few granular casts. Many leucocytes and epithelia.

April 12, 1923—Amber. No sediment. Acid. S. G. 1020. No sugar. Light cloud albumin. Occasional light granular casts. Few R. B. C. Many leucocytes. Occasional hyaline cast.

April 3, 1923—**White Blood Count**—20,100. Polys.—90 per cent. Lymphs—10. per cent.

April 6, 1923—**White Blood Count**—10,900. Polys.—92 per cent. Lymphs—6. per cent.

April 12, 1923—**Spinal Fluid**—Whitish, cloudy. No reduction for sugar. Heavy cloud of globulin. 4,200 cells. Polys.—99. per cent. Lymphs—1. per cent. Direct smear—gram positive diplococcus,—resemble pneumococci.

April 6, 1923—**Sputum**—No T. B. bacilli found.

April 6, 1923—**Sputum**—Pneumococcus, Group IV.

April 12, 1923—Precipitin test of spinal fluid—pneumococcus, Group IV.

April 14, 1923—**Blood Culture** positive for pneumococcus.

**Autopsy No. 7631.**

Performed by R. S. McGinnis.

**Clinical Diagnosis**—Lobar pneumonia; pneumococcal meningitis.

**Bacteriological Diagnosis**—subdural pus, pneumococcus, group IV. Blood—pneumococcus; Spinal Fluid—pneumococcus.

**Gross Anatomical Diagnosis**—

Heart—acute myocarditis; fibrosis; acute vegetative endocarditis of mitral valve; anterior aortic cusp shows slight thickening and calcification. Left lobar pneumo-

nia. Diffuse nephritis. Cloudy swelling of liver.

Brain—pneumococcic meningitis. Weighs 1120 gms. A fibrino-purulent exudate of greenish yellow color—is present over the convexity of the pia (much thickened by the exudate), which fills up many of the fissures. There is even more exudate about the base, and the pontile structures are recognizable with difficulty.

*Microscopical Examination*—(Dr. Freeman, No. 23-99, N. P.)—everywhere the meninges are thickened by fibrino-purulent exudate; considerable cerebral edema, and the ganglion cells show moderate chromatolysis.

*Diagnosis*—Suppurative meningitis and cerebral edema.

#### *Endocarditis of the Tricuspid Valve*

Case XI. *Pneumococcus Meningitis and Acute Vegetative Endocarditis of the Tricuspid Valve*. Alice M., Woman's Medical Ward. White woman. Age 37. L. 5469. Autopsy No. 17,200. Service of Dr. Davil Riesman, Philadelphia General Hospital. Dr. H. Bacon. Interne. Admitted, April 28, 1926; died, May 6, 1926.

Patient was admitted for a right lobar pneumonia. She later developed a rigid neck, positive Kernig sign, twitching of the hands and arms. She received 28 c. c. gentian violet (1. per cent) intravenously. 5/7/26—eye examination (Dr. O'Brien)—showed low grade neuroretinitis O. D., O. S.—negative. Urine analysis practically negative. Sputum negative for T. B. bacilli. Spinal fluid markedly turbid under increased pressure showed 1700 cells per cu. m. m.; 100 per cent polys.; trace of globulin; no reduction of Benedict's solution. Blood culture—pneumococcus group IV. Blood Wass.—Neg., all antigens. Blood chemistry—sugar, 98 mgm. per 100 c. c.; urea, N—14; uric acid—4; (4/29/26). (5/6/26)—blood sugar—111 mgm.; urea—N. 17 mgm.; blood count—(4/30/26) R. B. C. 3,500,000; W. B. C. 17,200; Hb 17.1 gms.; polys. 86. per cent; lymphs, 14. per cent. 5/6/26—W. B. C.—13,100; polys. 78. per cent; lymphs 13. per cent; Mon. 8, Eos, 1.

Autopsy performed by Dr. W. P. Belk.

*Gross Anatomical Diagnosis*—Acute vegetative endocarditis—tricuspid valve; subacute adhesive pleurisy; encapsulated empyema; resolving pneumonia both apices; recent bronchopneumonia both bases; abscess formation; (right lobar pneumonia); follicular splenitis; acute tubular nephritis; liver shows congestion; cloudy swelling; fatty infiltration. Adrenals—congestion. Uterus—Multiple fibroids.

Brain—subdural purulent exudate. Subarachnoidal exudate most marked on convex surface. Cortical atrophy (moderate), with moderate superimposed edema; pallor of brain; very slight ventricular dilatation. Brain weighed 1330 gm.

*Histological Diagnosis*—Lungs—broncho-pneumonia; abscess, right lower lobe; resolving (lobar?) pneumonia; and atelectasis (partial). Spleen—acute diffuse splenitis. Cloudy swelling of adrenals, liver, kidneys. Brain—acute pyogenic meningitis. 26-180 N. P. (Dr. Winkelman)—5/8/1926. Heart—weighed 300 gm. normal in size and consistency. Posterior leaflet of the tricuspid valve contains a vegetation about  $2\frac{1}{2} \times 2\frac{1}{2}$  cm. in diam., with a faint greenish color. Anterior leaflet contains a much smaller vegetation 1 cm.  $\times$  5 cm. Smears from vegetation stained for bacteria.

*Cause of Death*—acute purulent meningitis.

Case XXII. *Pneumococcic Meningitis and Hypertension*. Mary B. Woman's Medical. L. 8949. Ward 223. Autopsy No. 18,186; Philadelphia General Hospital. Service of Dr. Rose V. Patterson. Interne, Dr.

Helen Williams. Admitted March 26, 1927; died, April 5, 1927. White, age 42.

S. 235

Blood pressure ———. She received 5 grains numo-  
D. 128

quin hydrochloride in 60 c. c. normal saline, intraspinally. Rigidity of neck.

April 2, 1927—Cisterna puncture done—fluid was turbid. Irrigation of spinal canal with normal saline.

April 3, 1927—Spinal puncture done. Turbid fluid.

April 3, 1927—Spinal and cisternal puncture done, and canal washed with normal saline. Hypodermoclysis, 2000 c. c.

April 3, 1927—(at 9:30 p. m.)—30 c. c. cloudy fluid withdrawn through lumbar puncture.

April 3, 1927—Blood count—R. B. C. 3,800,000; W. B. C. 18,000; Hgb. 13.8 gms.; polys. 85. per cent; lymphs 12. per cent; L. M. and Trans. 3.

Blood Chemistry—(3/28/27)—Sugar 96 mgm.; urea—N, 10 mgm.

Spinal fluid—4/2/27—1765 cells; 100. per cent; polys; heavy trace globulin; sugar positive and according to Dr. H. Williams smears showed *pneumococci*. 4/4/27—Culture—negative. Fece—no ova or parasites.

X-ray of sinuses—negative.

Ears—no discharge; negative (Dr. Zacks).

Autopsy No. 18186—showed the following: Heart—left ventricular hypertrophy, dilatation, edema. Lungs—lobar pneumonia, right and left lower lobes and middle right. Spleen—acute hyperplasia. Kidneys—chronic glomerular nephritis. Liver—congestion, cloudy swelling and degeneration. Early interstitial pancreatitis. G. I.—tract, normal, brain—acute purulent meningitis, from sphenoids to ethmoids. There was a smear taken at autopsy of the purulent material which showed *pneumococci*.

Case XIII. *Pneumococcic (Group IV) Lobar Pneumonia, Acute Purulent Meningitis, and Acute Vegetative Endocarditis*. Ernest R. Men's Medical, Pneumonia Ward, J. 8816. Service of Dr. Joseph Sailer, Philadelphia General Hospital. Interne—Dr. C. A. Siler. Admitted May 4, 1922; died May 15, 1922, 6:50 p. m. Autopsy No. 6776, performed by Dr. McCutcheon.

*Chief Complaint*—Pain in back. Patient was taken sick April 19, 1922, with chills, sweats, fever and pain in the chest, legs, and arms; headache occasionally; cough weak. Never had any trouble like this before. Never had typhoid fever, malaria, scarlatina, diphtheria or pneumonia. Always pretty well. A few weeks before present illness had influenza—and was sick for two weeks. Is single. Never had venereal disease. Is a laborer on the road.

*Family History*—Negative.

Examination disclosed lobar pneumonia (left base). May 15, 1922—Spinal fluid—25 c. c. turbid fluid removed under increased pressure. Laboratory reported the presence of *Gram-positive diplococci* in the cerebrospinal fluid. Twitchings quite marked about the face. Brudinski and Kernig signs positive. Patient developed pulmonary edema, and died at 6:50 p. m. This patient was seen by Doctors Sailer, Kelly, Siler, Smith and Oehlhofer.

*Laboratory Reports*—Urine—negative (May 5, 1922). (May 6, 1922)—Blood count;—R. B. C. 5,300,000; W. B. C. 25,500; polys. 80. per cent; lymphs, 15. per cent; trans. and mono., 5. per cent; no malaria organisms. (May 9, 1922)—Blood Wasserman—negative with all antigens. Blood chemistry—Urea 14 mgm. per 100 c. c. W. B. C., 12,400; polys. 90. per cent; lymphs, 9. per



cent; mono. 1. per cent. Specimen of sputum-pneumococcus typing by mouse inoculation method shows pneumococci Group IV. B. Friedlander present in greater numbers than pneumococci. Reported by J. C. Small. Autopsy No. 6776.

**Clinical Diagnosis**—Lobar pneumonia; pneumococcal meningitis.

**Bacteriological Diagnosis**—Heart blood—streptococcus viridans. Heart valve—streptococcus viridans. Brain—streptococcus viridans. Lung—pneumococcus Group IV Friedlander's bacillus, Hemolytic strept.

**Gross Anatomical Diagnosis**—Heart—acute vegetative endocarditis of tricuspid valve. Lungs—Lobular pneumonia—stage of resolution; fibrinous pleurisy; multiple onfarcts; edema. Kidneys—congestion and cloudy swelling. Liver—cloudy swelling. Brain—acute meningo-encephalitis.

**Histological Diagnosis**—Heart, myocarditis, chronic interstitial. Lung—Infarct (septic), lobular pneumonia. Kidneys—cloudy swelling. Pancreas—cloudy swelling. Brain—acute meningo-encephalitis.

**Cause of Death**—Lobular pneumonia due to pneumococcus Group IV acute meningitis due to streptococcus viridans.

Heart—Weights 435 gm. Tricuspid valve shows several extremely large vegetations, the largest is 3 cm. in diameter, and a minute verruca on aortic and one on mitral valve, former is pale and ragged; latter red.

Lower lobe of left lung is consolidated; left lung weighs 700 gm. Lower lobe in right lung shows consolidated area; right lung weighed 730 gm.

Spleen weighs 375 gm., organ is flaccid. Capsule thickened. Stomach and intestines grossly normal. Other organs practically negative. Brain-weighs 1385 gm.

(Dr. Parker.) No. 22-94. The dura is thickened. The pia is thickened over the intrapeduncular space, especially and throughout the entire brain. The blood vessels are all congested and filled with blood. There is considerable edema of the meningismus character. There is considerable atrophy of the frontal lobe (superior and middle lobe), and of the superior frontal lobe. The brain is soft and of normal size.

**Gross Diagnosis**—Convolutional atrophy. Pial thickening. Dura thickening. Congestion of the blood-vessels.

**Microscopical Examination**—Frozen section of the brain made after hardening in formalin 2 days. They showed a marked infiltration of the meninges with cells—mainly polynuclears—but to a less extent lymphocytes. There is a marked reaction on the part of the cortex.

**Diagnosis**—Acute meningo-encephalitis.

**Case XIV. Pneumococcus (Type II) Meningitis with Lobar Pneumonia**—James P., Men's Med. L. 9073. Philadelphia General Hospital. Service of Geo. M. Piersol. Interne: Dr. Alice North. Autopsy No. 18263. Admitted April 16, 1927. Died April 22, 1927, 6:15 A. M. Age 26. White man. Stevedore.

**Chief Complaint**—Cough and expectoration (bloody). Shortness of breath. Delirium tremens. Pain in right side of chest. Patient was drunk four days ago, and was taken with a sudden chill and fever. Lobar pneumonia right lung. Blood pressure: 105

50

April 17, 1927—Spinal puncture done.

April 21, 1927—2 p. m.—Developed purpuric-like rash on abdomen, arms, back and chest.

10:00 p. m.—Opisthotonos; stuporous. Marked dilated Kernig. Knee jerks very much exaggerated.

Bilateral Babinski. Pin point pupils; extreme hyperesthesia of entire body. Blood pressure: 90

50

**Spinal Puncture**—35 c.c. very cloudy fluid under great deal of pressure, forming large pellicle, many polynuclear cells.

April 16, 1927—W. B. C.—4,300. Polys.—57. Lymphs.—40. L & Trans.—3.

April 18, 1927—W. B. C.—6,100. Polys.—70. Lymphs.—28. L & Trans.—2.

April 16, 1927—Blood culture—staph. albus (contamination).

April 22, 1927—5:00 a. m.—Temperature rose to 108 degrees; pulse 140 plus. respir. 65 before death. Spinal Fluid Culture—Pneumococcus, Type II.

**Autopsy No. 18, 263**—James P. Died April 22, 1927, at 6:15 p. m. Autopsy performed by G. N. Robson, 8 hours after death. White man, age 26. Service—Dr. G. M. Piersol. Interne—Dr. Alice North.

**Clinical Diagnosis**—Pneumococcus meningitis. Right Lobar Pneumonia.

**Gross Anatomical Diagnosis**—

**Heart**—Myocardial degeneration and dilatation.

**Lungs**—(Left) passive congestion and edema. (Right) acute fibrinous pleurisy and lobar pneumonia.

**Upper Lobe**—Gray stage; lower lobe red stage. Multiple abscesses; purulent bronchitis.

**Spleen**—Acute splenic tumor, with -degeneration.

**Kidneys**—Passive congestion, cloudy swelling.

**Liver**—Cloudy swelling; fatty degeneration.

**Stomach**—Dilatation. Chronic gastritis.

**Intestines**—Acute enteritis.

**Brain**—Meninges edematous and cloudy, showing here and there a purulent appearance. Some injection of vessels. Acute purulent meningitis.

We believe the earlier and more frequent use of the combined treatment in severe cases of meningitis (purulent) by repeated lavage and serum injections through cisternal and lumbar punctures and, if necessary, ventricular puncture, will result in more recoveries. Subarachnoid block occurs in many cases rather early, and the usual intravenous and intraspinal injections alone, often fail to bring about expected improvement. It is chiefly, to emphasize the value of the *more frequent and early* use of the combined methods of treatment, in cases of purulent meningitis, that we offer the following case report:

**Case No. XV.—Purulent Meningitis and Recovery**—Hugh F., Medical Service of L. Napoleon Boston, Chief; Hyman I. Goldstein, Assistant Chief; Morris Kleinbart, Interne. Philadelphia General Hospital. Patient was a man, white, age 19; unconscious when admitted.

It was learned that he had a heavy "cold" for about 2 weeks, and an annoying cough. The day before (February 10, 1927), he had come home from work (9:00 a. m.) with some paralysis of left side, but this appeared to improve.

At 11:00 a. m. on day of admission, he began to get flighty, then lost consciousness, and had not recognized anyone since that time. Screams and yells and tries to get out of bed, making movements with fingers.

Only previous illness was an attack of influenza. Had some trouble with left ear last year in Naval Station. Measles, mumps and whooping-cough when a baby. Had some pain in ear and head past week.

February 11, 1927—Admission note—Fairly well nourished. Lies restlessly in bed, in restraint. At times shouts and screams for his mother, at other times is quiet. Seems very sick. Does not respond to ques-



tions. Skin is moist and warm. Axillary temperature 100-2 F. Pulse 100.

**Scalp**—No signs of injury. **Ears**—Left considerable cerumen; when washed out shows injected canal; drum—landmarks gone. Right ear—Much cerumen. **Eyes**—Pupils round, regular and equal; normal in size and react to light. **Nose**—swelling of mucous membrane. **Mouth**—Tongue dry and coated; lips dry and cracked; teeth fair. Marked rigidity of head. **Thorax**—normal form and shape; percussion note clear throughout both sides; no rales heard. **Heart sounds**—fair quality; no murmurs; cardiac rate 100 per minute; regular as to force and rhythm. **Abdomen**—flat, tendency to scaphoid; no pain, tenderness of rigidity; masses felt; no suprapubic dullness; no rashes. **Extremities**—arms and legs well formed; no palsies; knee jerks hyperactive; no ankle clonus; marked defense reaction on stroking plantar surface each foot. **Positive findings**—rigidity of neck; hyperactive reflexes; temperature, 100-2 F. **Provisional diagnosis**—Meningitis.

February 11, 1927—6:00 p. m.—Lumbar puncture. Removed 50 c.c. turbid milky fluid. Examination of spinal fluid: 200,000 cells per c.m.; 95. per cent polys.; 5. per cent lymphs. No organism found by Gram or methylene-blue stain. Capsule stain showed some few organisms. Probably *pneumococcus*.

Examination of left ear showed much cerumen and blood. Ear consultation (Dr. J. C. Donnelly): left ear, impacted cerumen against drum membrane which was removed by saline solution. Ear drum distorted but probably due to cerumen. Paracentesis revealed only a bloody discharge. No sign (locally) of involvement of mastoid region. No tenderness, swelling or discoloration. Eye consultation (Dr. Fritch): right pupil 2.5 m.m.; left pupil 3 m.m.; react sluggishly to light and convergence. Rotations are limited externally in left eye. Normal in all other directions. **Nose** (Dr. Keenan): Left nasal chamber negative for sinusitis. Impossible to inspect posterior portion on right side on account of anterior deflection of nasal septum. Ears negative for any acute or chronic suppurative lesion.

February 11, 1927—Cisterna puncture at 11:00 p. m.; 20 c.c. turbid cloudy fluid removed. Lumbar puncture done. *Spinal canal washed with normal saline solution*; 30 c.c. *antimeningococcic serum* given, intraspinally. Spinal fluid cell count: 125,000; polys. 95. per cent; lymphs. 5. per cent; Stat blood count—W. B. C.: 17,800; polys. 90. per cent; lymphs. 10. per cent.

February 12, 1927—Fluid removed by cisterna puncture; cloudy and turbid—smears (Dr. Small) made by Gram technic. Gram positive diplococci found—thought by Dr. J. C. Small to be *pneumococci*.

February 12, 1927—6:00 p. m.—Cisterna puncture—15 c.c. turbid fluid removed. Pressure 35 m.m. mercury. Lumbar puncture m.m. mercury. Irrigated canal with normal salt solution, fluid going in through lumbar needle and coming out through upper (cisterna) needle. Injected 15 c.c. antimeningococcic serum through upper needle and 15 c.c. through lower needle.

February 12, 1927—*Spinal fluid examination*: cell counts: 6,200 per cm.; polys: 89. per cent; lymphs: 11. per cent; globulin present; sugar in spinal fluid positive. Patient exhibits a peculiar mental state. At times has illusions—mostly visible—few auditory. At other times he has lucid periods, during which he is quiet and will answer questions. He has no diplopia, no ocular palsies; pupils regular, equal and react to light. Vision not impaired. No nystagmus. There is still *marked rigidity* of head. *Kernig* is positive. Plantar reflex-defen-

sive phenomena. *Blood pressure*: (left arm): S. 130

D. 90

At times patient complains of *severe headache*. Calls for his wife and mother, imploring them to help him; there being no response, he uses abusive language. He believes he is at home.

February 13, 1927—Less sick to-day; is alert and oriented as to time, place and persons. Answers questions promptly and correctly. No diplopia; no marked impairment of vision. Head still rigid. *Kernig* positive both sides. Hyperactive knee jerks. No Babinski; no ankle clonus. Tongue shows some aphthae; dry; pupils equal and regular; react to light. Patient takes liquid well. Stat blood count:—20,400 W. B. C.; polys.—88. per cent; lymphs.—6. per cent; trans.—6. per cent. Blood culture—Diphtheroid bacilli (contamination). Blood pressure—(left arm)—S. 120

D. 80

February 13, 1927—4:00 p. m.—Patient placed on abdomen, head over edge of bed and flexed. *Cisterna puncture* performed. Pressure 30 m.m. Hg without allowing fluid to drain out; lumbar puncture done and pressure found to be 20 m.m. Hg. Fluid drained through cisterna puncture cloudy but not so much as previously. *Irrigated spinal canal*, fluid running through lumbar end and out through upper end. Used 200 c.c. normal saline solution and enough mercurochrome—200 solution—just to give fluid reddish tint. Gave 15 c.c. antimeningococcic serum through lumbar needle. Patient was turned on back and fell asleep. Blood pressure (after canal washing and injection) S 150. Said he

D. 90

felt better. Spinal fluid count: 6,000 cm.; polys.—69 per cent; lymphs.—29 per cent; trans.—2. per cent. Globulin and sugar present.

February 13, 1927—10:00 p. m.—Lumbar puncture, removed 30 c.c. fluid. Tinted red (mercurochrome). Pressure 30 mm. Hg. Injected 30 c.c. antimeningococcic serum.

February 14, 1927—Complains of headache. Rational at all times. Cisterna-lumbar lavage with normal saline solution (100 c.c.); cooperation of patient not so good. *Blood pressure* before washing canal and injection: S. 130 after: S. 150 Temperature—98.6 F., pulse

D. 90

D. 90.

—80, resp. 24.

30 c.c., antimeningococcic serum, half injected into subarachnoid space "cisternally" and half through lumbar needle; 30 c.c. spinal fluid removed from cisterna, 20 c.c. fluid removed through lumbar puncture needle.

*Examination lumbar S. F.*—cells 1900 cm.; trace globulin, degenerated polys.; no new cells. *Cisternal fluid*—cells 1550 c.m.; trace globulin; degenerated polys., no new cells. Sugar, 63 mg. per 100 c.c. February 15, 1927. Patient seen by Dr. David Riesman; has herpes of lips and nose; rigidity of head and neck; has had some vomiting and headache. *Positive Kernig*; knee jerks react promptly; defensive reaction to plantar stimulation; moderate dermatographia. *Palsy* of left external rectus this evening; *sees double*; pupils unequal, round and regular; react sluggishly to light.

February 15, 1927—7:00 p. m.—Cisterna puncture: removed 15 c.c. fluid (blood tinged); not under so great pressure as previously. Lumbar puncture: fluid also blood tinged. *Injected 150 c.c. normal saline solution*. Allowed fluid to drain out and, then gave 15 c.c. anti-

meningococcic serum by lumbar needle and 15 c.c. by *cisterna puncture*. Cooperation by patient good. Blood pressure before this procedure S. 125; after 140; pulse

D. 85 90

94, temp. 99 F. *Spinal fluid*: positive for globulin.

February 16, 1927—Patient is awake; oriented as to time, place and persons; rational; rigidity of head and neck; positive Kernig; no diplopia. A number of red-dish papules on right hand.

February 16, 1927—7:00 p. m.—Lumbar puncture; removed 30 c.c. cloudy fluid.

February 16, 1927—10:00 p. m.—Patient shows a rash over shoulders and thorax. Reddish macules with many discrete vesicles. There is also a patch over left elbow. Much itching of skin wherever rash appeared. Urticaria (due to serum). *Spinal fluid examination*—Cells 1500 cm.; polys 88 per cent; lymphs 12 per cent; red blood cells and globulin present. *Smears*—no organisms found. *Culture*—neg.

February 17, 1927—Patient seen by Dr. C. W. Burr, who states patient undoubtedly had a severe attack of meningitis and the prompt irrigation of canal and use of serum saved his life. Serum rash entirely gone.

February 19, 1927—Blood pressure (right arm)—115; (left arm)—115; able to move and flex head. Feels much better. Eats well. There is still some rigidity, but this is not marked. Knee jerks hyperactive. Kernig's sign still present. Pupils round, regular and equal. React to light promptly. No squint, no apparent palsies, no diplopia.

*Lumbar puncture*—fluid clear and under pressure. Removed 25 c.c. *Urine Analysis*—yellow; alkaline—1.013; no albumin; no sugar; several analyses, practically negative; sugar plus in one specimen (2/12/27). *Blood counts*—W. B. C. 17,800, (2/11/27) polys.—90; lymphs.—10. (2/13/27)—*Blood counts*—W. B. C. 20,400; polys.—88; lymphs.—6; trans.—6. (2/15/27)—*Blood counts*—W. B. C. 12,100; polys.—79; lymphs.—11; trans.—10.

*Spinal fluid cultures*—all negative (six). Injection into mouse (1 c.c. fluid)—it failed to die.

February 15, 1927—*Smears* (S. F.)—Gram negative intracellular diplococci. Nose—staphylococcus albus. Mouth—streptococci and pneumococci.

February 26, 1927—(Final Note). Patient in good condition. Up and about the ward past few days. No rigidity of head and neck. No Kernig sign. No Babinski or ankle clonus. Knee jerks hyperactive. Biceps jerks active. T. P. R. normal.

February 25, 1927—*Lumbar puncture*—cell count, 40 cells per cu. mm.; globulin, trace; fluid is clear; lungs, clear, heart, negative; abdomen, negative; herpes of lips gone; pupils round, regular and equal; react to light and accommodation; no diplopia; external ocular muscles normal (movements).

Patient was admitted to ward in *comatose* condition. Signs of meningitis. Treated by *spinal drainage*, lavage and antimeningococcic serum. Cell counts at first very high. Gradually diminished to 40 cells per c. mm. *Cultures* were negative.

*Diagnosis*—Acute Purulent Meningitis (probably pneumococcic).

A case of pneumococcic meningitis, Jennie B., negress, age 40, L.7394, admitted December 12, 1926, Philadelphia General Hospital, in the service of Dr. T. G. Schnabel—had a right (middle lobe) lobar pneumonia. This patient died twelve hours after admission, and there was not sufficient time for a more thorough study of the case. (Coroner's case). White blood count—27,000; R. B. C.—4,000,000. At 11:30 A. M. spinal puncture was done, and turbid fluid under moderate pressure was withdrawn; showed 288 cells per cu. mm.; polys. 82 per cent; lymphs. 18 per cent; and Gram positive intra- and extra-cellular diplococci, and heavy trace of globulin. At 4:30 P. M. spinal lavage with normal saline was given until return fluid was clear; and 20 c.c. 1 per cent mercurochrome—220 soluble was instilled.

Kolmer advises the early use of intraspinal injections of optochin or ethylhydrocuprein hydrochloride 0.5 cc. of a 1:1000 dilution per kilo of weight once or twice in 24 hours as for a period of several days, following the withdrawal of spinal fluid. This dose amounts to 30 cc. of a 1:1000 solution for a young adult weighing about 125 pounds (equivalent to 0.0005 gm. of the drug per kilo of weight). Kolmer (*Therapeutic Gazette*, Oct. 15, 1920, p. 697) believes this amount may be accepted as safe, even when given once or twice a day for four or five days, and that the production of amblyopia or toxic effects need not be feared.

Roussel (*Atlantic Med. Jour.* 30:159-160, Dec., 1926) reported a recovery of a case of pneumococcus type 2 meningitis simulating diabetic coma, in a man aged 40 years. Urotropin was given in large doses, and several lumbar punctures with drainage were performed. Antipneumococcus serum was not used.

Fleischmann (*Klin. Wchnschr.*, 1922, 1, 217-220) reported one cure of a suppurative meningitis by the repeated intravenous injections of trypanflavin after withdrawing cerebrospinal fluid.

Young, Hill and Scott (*Arch. Surg.*, May, 1925, Vol. X) used the mercurochrome—220 solution intravenously and intraspinally, as did McAskill (*Annals of Otology, Rhinology, and Laryngology*, 35:502-507, June, 1926), who reports a recovery, following the combined intravenous, *cisternal* and *lumbar* injections of mercurochrome—220 (1 per cent 20 cc. solution, made from the scales), in a desperately sick girl, aged 11 years, suffering from purulent leptomeningitis, secondary to otitis media.

Ebaugh (*J. A. M. A.*, Vol. 85, No. 3, 1925) recommends punctures of the *cisterna magna*. In performing 1550 punctures in a total of 190 patients no serious accident occurred.

If patient does not improve, the administration of antiseptic fluids, sera, etc., should also be administered into the *ventricles*.

Hengstler, in May, 1925, used intravenous injections of mercurochrome in a series of meningitis cases, occurring secondary to middle ear infection. (*Minnesota Medicine*, 9:240-241, May, 1926).

J. B. Ayer recommends *cisterna magna* puncture combined with lumbar puncture. (*Arch. Neurol. and Psychiatry*—Vol. IV: 529, 1920; *Journal Bone and Joint Surgery*—Vol. V: 18, 1923; *Arch. Neurol. and Psych.* Vol. VII: 38, 1922).

Ratnoff and Litvak (*Arch. Pediat.*, July, 1926, p. 466) report a recovery of a female child aged 7½ years, from pneumococcus meningitis following the use of antipneumococcus serum and ethylhydrocuprein hydrochloride (optochin) in doses recommended by Kolmer (0.5 cc. of 1:1000 (intraspinally) solution per kilo of weight once or twice in 24 hours, after the withdrawal of cerebrospinal fluid; a dose amounting to 30 cc. of 1:1000 solution and equivalent to 0.0005 gm. of optochin per kilo of weight and sixty times less than the toxic dose).

Carnovan Brown reported a recovery, in a man aged 34 years following the use of five injections of pneumococcic vaccine. (*Lancet*, II, p. 519, Sept. 16, 1916).

Kolmer (*Arch. Otolaryngology*, Vol. III, No. 6, 481-513, June, 1926) discusses fully the chemotherapy and serum therapy of pneumococcus and streptococcus meningitis. He states, he has seen in seven years, 41 cases of pneumococcus meningitis of otitic or nasal origin, or following skull fracture (base), all of which died.

Netter and Cesari (*Bull. et me'm. soc. med. d. hop. de Paris*, 47:763, May 25, 1923) reported that of sixty cases of pneumococcus meningitis observed by them, only six recovered.

Rainey and Alford treated cases of septic meningitis by continuous spinal drainage (*Jour. A. M. A.*, 81, 1516, Nov. 3, 1923).

Dandy (*Surg. Gynec. and Obst.* 39: 760, Dec., 1924) has saved three out of four cases of septic meningitis by continuous drainage from the cisterna magna.

Kolmer has found the only effective method of treatment in severe streptococcus and pneumococcus leptomeningitis (in dogs), to be trephining and washing one or both ventricles through to the cisterna magna with warm saline or Ringer's solution, escape of the fluid being provided for by the insertion of a needle into the cisterna magna.

Kolmer urges the combined use of trephining and puncture of a ventricle along with puncture of the cisterna magna and lavage from the ventricles to the cistern, and in pneumococcus infection the additional use of pneumococcus antibody solution, and ethylhydrocuprein hydrochloride (optochin or numoquin hydrochloride) in doses of 0.5 cc. of 1:1000 solution per kilogram intraspinally and into the cisterna magna. Kolmer has not found mercurochrome injections intraspinally or intravenously to be of any great use in severe septic meningitis.

Neutral acriflavine, rivanol, gentian violet, etc., have all been tried with varying and unsatisfactory results.

Royster treated a case of streptococcus meningitis in a boy aged two years, with sixteen intraspinal injections of small amounts of gentian violet (*Am. J. Dis. Child*—28:34, July, 1924).

Kolmer and Idzumi (*J. Injec. Dis.* 26: 355, April, 1920) treated eleven patients (pneumococcus meningitis) with intraspinal injections of ethylhydrocuprein alone, or in combination with homologous serum without a single recovery.

Weaver (*J. A. M. A.* 72: 1362, May 10, 1919) reported a case of acute streptococcus viridans meningitis with recovery following the intraspinal and intramuscular injections of a polyvalent antistreptococcus serum, this according to Kolmer, is an unusual result.

Litchfield (*Jour. A. M. A.* 72:1345, May 10, 1919) reported five recoveries in a series of ten cases of meningitis occurring in lobar pneumonia, treated by intraspinal and intravenous injections of Kyes chicken antipneumococcus serum.

McLean and Caffey (*J. A. M. A.* 87: No. 2, 91-94, July 10, 1926) reported that of eleven patients (meningococcus meningitis) in whom serum was injected into the ventricles and cisterna magna because of obstruction of the subarchnoid space, eight made complete permanent recovery. One of these patients was an infant 35 days old, and when last seen, at 12 months of age, she was normal in every respect.

Synge (*Lancet*, 210:761, April 10, 1926) reported a recovery from pneumococcus group IV meningitis, a boy aged 16 years, kicked by a horse, causing depressed fracture of left side of bridge of nose and an incised wound two inches long above the right ear. Treated by five lumbar punctures, with drainage of 20 to 40 c.cm. each time, and hypodermic injections of an autogenous pneumococcus vaccine.

Rolly (1911) reported four cases of recovery out of thirty cases (pneumococcus meningitis). These four cases also had lobar pneumonia. Spinal fluid contained pneumococci and pus. These four cases received repeated lumbar puncture and drainage. One was a child 2¼ years old, who had sixteen lumbar punctures and from whom was withdrawn a total of 600 c.cm. of cerebrospinal fluid.

Synge mentions 7 per cent recoveries in a series of

forty-two cases and 10 per cent recoveries in another series of sixty cases, recently reported.

Schack (*Munch. Med. Wchnschr.* 1924, No. 43, p. 1498); Bardachsi (*Munch. Med. Wchnschr.* 1920, No. 5, p. 117), and Cordua (*Berlin, klin. Wchnschr.* 1921, No. 45, p. 1323), speak of recoveries from pneumococcus meningitis following the use of Morgenroth's op-tochin.

NOTE: Numoquin Base (ethyl hydrocuprein Merck) can be administered by mouth, in four grain doses, with glass of milk, every five hours, day and night, for three days—dose for adults. Numoquin hydrochloride is used intraspinally and intravenously.

Jemma (1896) reported one of the earliest cases of recovery from pneumococcus meningitis. Aufrecht reported 3 recoveries (1902).

Synge advises the essential treatment in pneumococcus meningitis is repeated lumbar puncture and drainage, and concludes that recovery occurs in ten per cent of the cases.

Kolmer believes that lavage of the ventricles and subarachnoid space in general is by all odds the most valuable means of treatment, and especially when drainage from the cisterna magna is provided.

Hill has even advised laminectomy to provide for continuous drainage (*J. A. M. A.*, 76: 267, Jan. 22, 1921).

Eichelbaum (1926), of the United Fruit Company, reported a recovery from pneumococcus meningitis, in a negro, treated with injections (intraspinally) of antipneumococcus serum and lumbar punctures.

Dandy (*Surg. Gynec. Obst.*, 39: 760, Dec., 1924) has reported the recovery of three cases of septic meningitis in a series of four, ascribed to continuous drainage from the cisterna magna. (Two were streptococcus infections and one—a staphylococcus aureus meningitis).

Horn (*J. A. M. A.*, 80: 1124, April 21, 1923) reported a recovery from pneumococcus meningitis, in a syphilitic, treated by arsphenamine and autoserum therapy—patient's own serum injected intraspinally.

Kolmer believes antipneumococcus antibody solution is the most promising biologic product available at present for the treatment of pneumococcus meningitis.

The cisterna magna, according to Ayer, is the distributing center of the spinal fluid to both the cerebral subarachnoid space and the spinal subarachnoid space, and therefore, antipneumococcus antibody solution and normal salt solution are best injected here, after drainage, especially since meningitis is in the beginning a cerebral infection. Therefore the injection of serum near the site of disease in maximum concentration should result in much better therapeutic result and dissemination than serum injected in the lumbar subdural space alone. (Ebaugh: *Jour. A. M. A.*, July 18, 1925, 85: 184.)

Donald Stewart, too, (*Edinburgh Med. Jour.*, 34: 36-44, Jan., 1927), advises the use of cistern puncture in children—for diagnosis and treatment. For early diagnosis of tuberculous meningitis he prefers cistern puncture to lumbar puncture.

Jules Brady (*Med. Clinics of N. A.*, 9: 1; 165-167, July, 1925), uses cisternal puncture in the treatment of hydrocephalus, particularly those cases in infants, following meningeal hemorrhage.

Max Peet (*J. A. M. A.*, 86: 1818-1821, June 12, 1926), uses treatment by combined ventricular, cisternal and lumbar punctures in advanced cases of meningitis.

Gould (*Boston M. and Surg. Jour.*, 181: p. 713, Dec. 18, 1919), reported a recovery from pneumococcus meningitis following the use of antipneumococcus vaccine

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# The Rationale of the Newer Medicine

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## I

A faculty for understanding certain conditions of environment gives to the human brain its capacity for knowledge.

Elliott Smith limits this to the impressions that are received by the hand, as directed by vision.

Smith believes that growth of knowledge, through this increased understanding of environment, has always been and will always be the greatest factor for developing mankind.

Dr. William Mayo, in "Contributions of Pure Science to Progressive Medicine," indicates that man's most rapid development, at least within later generations, has been due to his employment of aids which amplify vision.

The investigation of organic activity by Sir James Mackenzie convinced him that specialized structure transfers energy, as a function, from a site of origin to a site for expression, serving to produce cellular response.

Mackenzie was convinced that cell impulse, originating in an unknown source, is of unknown quality, that it cannot be electrical, for electric stimulation of the cell produces abnormal effects.

Mackenzie found that vital cells are always functionally active in either storing or releasing energy. Release of energy occurs in response to the degree of urgency, by which transmission rate is governed.

Heat increases and cold retards functional activity. Activation of the cell is affected by the physical environment that is called thermal. Response of the cell is limited by a certain standard of temperature, to which the cell is adjusted.

Any attack upon the hereditary rights of the cell affects the transmission of impulse and imperils the activity of function. This follows upon any alteration of the environment to which the cell has become adjusted.

Certain nerve cells possess a specific control in directing the energy that governs the life of the cell. The capacity of the cell to respond to a transmitted impulse is as specific a property as that which occasions the display of energy. The entire operation is one of co-ordination, wherein faculties act harmoniously, in response to a native control that is deposited within vital cells.

Mackenzie stressed the fact that symptoms are produced by some agency that is active in the promotion and control of cell function.

Symptoms are signals of cell requirement, as the need for correction of faulty environment. This may show in a demand for adjustment to minor states, to which the cell is not uniformly adapted, and which affect transmission of impulse. In any event, there is shown requirement for restoration of normal functions and necessity for conformation or adaptation to the requirements of environment.

The cell depends, for construction and existence, upon valence, the index of chemic control in organic life.

Valence guides the formation, development and character of cell association which constitutes organic structure. It controls the interchange which is demanded for any arrangement of atoms in building the molecule. In itself, it is the exercise of function and is the very accurate response to the demands of fundamental law. It demonstrates that an active faculty resides within the cell to measure life tenure of organic combinations. Valence is the function which controls the tragedies of

cell life, and which preserves units when released from structural combinations, reconstructing them into new combinations and endowing them with benefits of function. It expresses the inherent chemic control residing within the more deeply rooted system of proton and electron composition, and which institutes atomic structure.

In viewing the single cell as a type of organism, there occurs little difficulty in regarding evolution as the assumption and expression of manifold duties throughout the period of cell life. If we associate two or more cells, it becomes apparent that the self-same process of duty continues to dominate the combined forces.

Features which protect function derive from the properties of atoms constructing the cell. These maintain the stability of the cell, in conforming with laws which govern the association or separation of protons and electrons to form new or to split existing units or atoms.

Altering the environment of the cell alters function. When the natural habit of the cell is changed, as in the alteration of accustomed environment, the cells are proportionally exposed to the same conditions that must affect all cells when implanted in strange surroundings.

Laws governing molecular forms impose the need for harmonious activity to prevent detriment in existing structure. No detrimental effects occur to the cell so long as the environment, to which it is adapted, remains unchanged.

A compensating adjustment preserves the cell within slight and acceptable fluctuations that occur in lesser alterations of environment. The cell's response to this protection measures the limitations within which life is permitted to continue.

The cell normally finds sufficient support within its immediate, elastic fluid, which serves to bear the brunt of attack from opposing forces and outer environment.

Specific control of growth, limitation of species, protection against degenerative influences, provision for repair, appropriation of nutrition from contributory field, show the necessity for the cell's conformation to the effects of environment.

Protective influences, appropriated from the reserves of forming atoms, and which preserve the cell and its functions, are re-enforced by cellular properties that are added in any structural growth. The additional quota serves to enrich function, add stability to the cell and extend the lease upon existence.

Alteration in environment consists of any relative or actual damage to cell life, its supporting medium or environment, sufficient in degree to affect the character, function or stability of the cell, or to disturb its normal impulse or response.

## II

The biologic estate of man has been attained solely through the ability of initial cells to conform to exactions imposed in environment.

Since basic laws govern all phenomena of life, vitality is an evidence of the cell having conformed to the requirements of environment in adaptation to surrounding influences.

Requirements imposed upon the initial cell must attach to each of its successors, if they are to live within the cluster which constitutes species or forms of existence. No cell could be permitted to depart from the inexorable decree of adaptation and maintain existence.



Proportional to the effects of influences brought to bear upon them, cells, singly or in association, must evince reciprocal response.

In the generation and preservation of the cell and its functions, elements are required to balance in definite and agreeable proportion. Each atom, in expressing a quantum of energy, has a specific influence in designing the architecture of the organic cell.

Function represents the energy that is derived from the sum total of atoms involved, and represents the efforts of the cell to adjust and harmonize these atoms within its orbit of existence. This pertains alike to generation, perpetuation and all other expressions of the cell. It shows that any faculty, whether it be called intelligence or mere functional expression, was possessed by the initial cell, existing therein as a property right or heritage, available upon summons to each succeeding cell, existing within like conditions of environment.

The cell can contribute to its progeny no privilege or property that it does not primarily command or possess, and no cell can inherit a specificism that does not, by right, descend through ancestral endowment.

Baines found that a sensitive galvanometric needle could detect the presence and measure the amount of electro-motive force existing in living cells, but could not detect the existence of any such properties in either dead or cancerous cells.

Electro-potential conveys the idea of some property that relates to and governs elements contained within organic cells. It is but one of the many diverse manifestations which affect inorganic and organic existence. Specific gravity, light, chemic union, ionic projection, activation, instinct and thought are but other examples of the innumerable expressions, in active phase, of energetic release, and which serve to depict the self-same power in some operative modality.

Life depends upon the solution of organic compounds, which are re-assembled in new structure. This process is in constant progression and attends evolution, which but means the addition of benefits to the cell that finds environment more and more favorable for existence, through its own powers of adaptation to such presenting conditions as occur in each succeeding age.

Physiologic process, in the organic cell, represents an energy that is identical with that which reposes in inorganic structure.

The vital cell, ingesting structural units of inorganic form, incorporates them within its substance, deriving power, expressing function and reflecting the energy contained within the elements composing the seemingly inanimate structure.

Eternally the chemic cycle must precede and follow an evolving process. No cell can have origin or persist but in accordance with the mandates of valence, else inertia dominates, combining power departs, activation of the cell fails to occur or to persist after having once been established.

Moodie's "Studies in Paleopathology" show the orderly sequence leading to the construction of the organic cell, from origin in the Archeozoic age, through various stages, to the present strata of existence.

Through continual change which occurs in growth, maturity is but a status of development relative to any preceding or subsequent period in cell life, which shows the attendance of constant efforts to stabilize or reconcile elements in altering environment.

Functional activities of organized structure show the dependence of the cell upon certain indispensable privileges, such as those converting starch to sugar, coagulating the blood, evolving ammonia from amino-acid, altering fat forms, or other recognized processes which

are required to maintain the presence of inorganic elements within the cell.

Present forms of organic life have resulted through control of growth as an adaptation to existing conditions. This has ensued through the transmission of the effects of heredity, to constitute that characteristic which is known as "conformation to species." This is the effect of "sensitivity" to influences in environment. "Sensitivity" expresses a defensive property and is a function of supreme importance in cell life.

Growth and defense have preserved a vibratile, organic cell, with capacity for responding to the changes which have beset its course, within the limiting range of variety which designates species, and which depicts the biologic history of cellular life.

The primitive cell, coping with and surviving the influences which attended its development, generated a descendant, which, while still advancing, responds to the identical laws that fathered its primitive ancestor.

Cells adapted to environment, through this influence of heredity, have become equipped with faculties for exchange of nutritive supply, and for free collaboration in eliminating waste.

The initial cell, now materially modified through adaptation, has minimized its antagonism for like associates, unifying efforts in developing defensive measures such as sensitization and traits of immunity.

From origin in gametogenetic mitosis, to involution in senescence of the cell, function keeps apace with environment. Progeria is an outstanding proof of mal-adjustment, wherein organic cells, trained by habits of heredity, are unable to adjust to mixed environment.

Age-worn efforts of the organic cell to acquire stabilizing elements have attained the present success of vertebral cell. Advanced over primitive forms, it has developed merited privileges upon which to base man's physical structure and found his intellect. All this depends upon a normality in the immediate environment of the plasmic blanket which encloses structural cells.

The reconciliation of atoms, within a limited orbit of existence, represents the facultative species of animal life. This equilibrium endures until trauma occurs of sufficient degree to alter the complementary properties which bind the biologic units in organic structure.

Cell growth, slow but progressive, is constantly stimulated by new experiences. Striking effects in development could only occur in cells so stimulated, and through successful coping with difficulties new species are formed. This sequence has occurred in all vertebrate structures which have grown along similar lines.

Toxic attack, cell over-strain, altered electro-potential, temperature variation, and other disturbances, require a continuous growth in protective features to assure cell development.

Defensive powers are expressed through the provision of a little understood property, designated as "complement". This is created within and furnished from the immediate plasmic environment of the cell.

Production of complement is stimulated by any effect that produces trauma of the cell. Cell trauma arises in any condition that alters accustomed environment, the effect being proportional to the degree of variation of the cell from its normal equilibrium.

Minimal trauma, of short or prolonged duration, may be followed by non-resolving conditions. More severe trauma results in more immediate disturbance, as in grossly disturbing effects of burns, light rays, changes in nutrition, or germ attack, and against which the cell is poorly protected.

Possibilities resident in the initial cell undergo realities through processes of development.

Any degree in attainment of perfection in cellular function could only follow through exposure of the cell to outside influence. Benefits follow these exposures, with the development of immunities, which are expressions of cell resentment to adversity, serving beneficially to enlarge the field of usefulness of cell life.

### III

The essential property of the cell, complement, represents that phase of existence wherein two or more properties mutually supplement each other, with equal dependence thereon for perfection of functional activity, protection being complete.

Abel shows recognition of this property in the mention of "some primitive substance which influences growth and shapes repair."

Complement, as required for activation of the cell, is of greater potential in advanced than in primitive cell forms, for, through development of organic structure, electro-potential increases.

Complement has a wider field of activity than in the limitations that are implied in Ehrlich's "side-chain formation". Complement designates activation of the cell without specific limitation. It is the dominant factor in the expressions of specific defense, fixation, immunity, refractory states and allergic manifestation. These expressions designate a protective function for direction against homogenous changes in cell life.

Burbank said: "Every variation in a plant which is produced by some change in its surroundings gives it a possible advantage over others which have not adapted themselves to their environment, and this advantage enables it to live and propagate itself and hand down those traits to its descendant," which applies as well to the higher typed cells of animal life as to those of vegetable form. Abel confirms this in the words: "Botanists speak of reactions of the single cell, in regard to the work of cytoplasm, hence we must regard the cell as the basis of all life, whether vegetable or animal."

The higher type of vertebral cell has not yet developed sufficient autolytic powers to dissolve and so dispose of embryonic cells planted in fields of more mature attainment.

Embryonic cells which have been isolated within an environment of advanced cells do not become integral with nor link to the maturer association, and so fail to become activated, and certain types, when introduced within organic growth, proffer detrimental influence.

Repair compensating for trauma is the provision in maturer growth, and this by the effects of a cell related to the embryonic type in form, with rather rapid formation of substitute structure. Furnished from a complementary reserve, of facultative endowment, active within certain limits of adaptable environment, exceptions are commonly un-noted, but occasionally controlling limitations are exceeded in an abnormal, unadaptable structure such as keloid.

When embryonic cells which have been sequestered within fields of maturer growth are released, because of lack of adaptation, there is a non-assimilation of maturer complement, resulting in disturbance of the plasmic environment of the maturer cell forms which are involved.

Where adaptation is not enforced, the embryonic cell is estranged, and despite a related remote ancestry, or previous identity in structural origin of both the maturer and embryonic cell forms that are involved, a state refractory to the other cell type occurs in each, for each expresses an attempt in domination over the other. The refractory state of the embryonic cell opposes that of the riper cell, determining states of disparity in attainment,

a normal defensive condition for each to express.

When concordant efforts of structural cells occur, temporary refractory states are normal provision for functional expression and life extension. The refractory state of the heart cell, for example, with its periods of rest and activity, undergoes systole upon re-activation through rhythmic nourishment of its composite structure, discharge of power and re-charge of energy occurring normally in regular sequence. This depicts the continuous adjustment to needs of adaptation, an advanced stage of activation occurring from the development in complement. The release of some ripened property stimulates a response in functional activity, the discharge of which is followed by recuperative function and again the ensuing display of force shows. So far as the human heart is concerned, this is accompanied by some leniency in margins of temperature variation in its blood environment, with return to normal expression permitted, certainly a most elastic compensation finding expression in this feature of cell life.

Discovery of the effects of fire by primitive man decidedly altered the existing physical state and activation of the human cell, in the ages long since. Food changes from cooking, dilution of elements through effects of heat, and seasonal alteration through development of taste, markedly influenced cell association, when comparison is made with the age which preceded the use of heat.

The relatively fixed thermal environment of the vertebral cell of man has gradually exerted an influence in the choice of zonal environment, in favor of the temperate, for the majority of the species. This selection of outer environment has had an effect in altering the standard of the immediate environment for the cell, the plasma.

Adaptation and conformity to needs must be a slow and progressive process, attaching to all species of existence. Through such a period of transition the human cell is forever progressing. While standards of intellectual attainment may seemingly be quite rapidly shifted, physical alterations occur through the efforts that environment induces, while anatomical structure varies but slightly over long periods of history.

In order that the cell may secure its entitled existence and benefits of functions to full capacity, adaptation to environment must occur, or, failing this, and relative thereto, sensitivity to environmental effects must continue to show. Fortunately, the human cell is the most facultative of known types, through the possession of intelligence, which allows greater conformity to environment by assisting adaptation.

For the reason that, in general, the environment of the human cell type finds more amenable adaptation through faculties of judgment, life within the cell has become more tenacious under the varying degrees of stress and variable electro-potential.

### IV

The blood maintains an elastic standard, with its variety of engaged elements, admitting both acid and alkaline substances, preserving its alveolar tension and H ion concentration of normal balance. An admissible fluctuation occurs within limited variations in temperature, and permissible disturbance may occur in the circulation without damage to cells that are dependent upon the plasmic fluid for vitality.

The H ion concentration of the blood grossly measures the equilibrium for cellular structure. It gauges the plasma, mentioned as the supporting environment for tissue cells, and which furnishes all fuel for cell energy. This standard for concentration represents the

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# Medical Times

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## Dr. Thomas Salmon

By the tragic death of Dr. Salmon the medical profession, and especially psychiatry, met with a great loss. His high character and lovable personality endeared him to a wide circle of friends. He was buried with military honors at his home in Vermont, for he was a real soldier. His services before he went to France early in the war were incalculable, since he alone prevented hundreds of the mentally unfit from being drafted into the army. A high officer in the Medical Corps states that his services to the A. E. F. as a psychiatrist were invaluable.

The writer knew him well in military and in civil life—behind the lines and in the battle area—and would add his tribute to the memory of one who was an ornament to his profession.

—HENRY C. COE.

## How Bowel Obstruction Kills

Gatch, Trusler and Ayres of Indiana University (*Arch. Surg.*, June, 1927) offers us a new conception of how bowel obstruction gives rise to gangrene and fatal toxemia. The gaseous distention of the strangulated loops through bacterial action within the lumen occludes the rate of blood flow through them; circulatory stasis and consequent necrosis result from the gaseous distention. If the bowel is actually incarcerated the necrotic process is more rapidly fatal than if simple occlusion alone occurs, for in the latter case reverse peristalsis may prevent overdistention. In other words, if it were not for the gaseous distention occluded circulation and necrosis would be minimal. This concep-

tion modifies considerably the assumption having to do with dehydration from vomiting and lessened absorption, with its supposed effect upon the local tissues, and with the assumption that the toxemia was due to the production of highly toxic substances within the lumen of the bowel. By this new view it would seem that the toxemia emanates from the death of the bowel wall itself consequent upon distention, and not from the bacterial changes that give rise to such distention.

## Simplifying Renal Function Tests

Dr. Arthur M. Fishberg, of the Mount Sinai and Montefiore Hospital (*J. A. M. A.*, June 25, 1927), finds tests which measure the quantity of some substance (as phenolsulphonethalein) excreted are deficient in that they do not detect the compensated stage of impaired renal function. Such tests may yield subnormal results in consequence of extrarenal factors, such as cardiac failure, although renal function is intact. Both these errors are avoided by the simple specific gravity test.

Fishberg believes that elaborate procedures are unnecessary for clinical purposes, the same end being attained by very simple methods, provided the clinical features of the case are always kept in the foreground.

In true renal insufficiency the chemical composition of the blood must be studied to note the accumulation of urea or nonprotein elements. The estimation of elements other than these Fishberg considers "a great waste of time and money."

In the compensated stage one should depend upon one of the tests of urinary concentration.

About six o'clock of the evening before the test the patient has his usual supper, which should not contain more than about 200 cc. of fluids. After this he neither eats nor drinks anything until the test is over. Before retiring he empties the bladder; this urine is discarded. On waking in the morning he passes urine, which is kept in a separate bottle. He remains in bed and urinates one hour later and again an hour after this, each urine being kept in a separate bottle. The specific gravity of each of the three specimens is measured, and the highest taken as the patient's maximum. The patient has had, with little inconvenience, about sixteen hours in which to concentrate. If kidney function is unimpaired, the specific gravity will exceed 1.025, often going as high as 1.032. In the severest impairment of renal function the specific gravity is only 1.010, and in intermediary cases figures between these extremes are obtained. In patients with true uremia the maximum is under 1.020, and usually much closer to 1.010. In every case exhibiting low specific gravity, it is important to observe whether edema is being evacuated, for this may simulate inability to concentrate.

Since adopting the specific gravity test Fishberg has rarely used any other urinary test of renal function.

Thus even the practitioner at the crossroads has no excuse for failing to determine the renal efficiency of his patients, and a subject now in a state of considerable confusion is much clarified.

## Increased Physical Therapy Service in Boston

Five years ago, the Directors of the Boston Reconstruction Clinic foresaw the needs of more organized and efficient medical aid to salvage the injured worker. Over a million American industrial workers each year sustain injuries enough to cause loss of time and seven times as many suffer from some illness.

The Clinic then organized under the Group Practice Plan, an association of medical men in different specialties of medicine who are in turn called upon in consultation until a diagnosis is established, and immediate care is given by the expert in the field in which the particular ailment is classified.

Today some of the greatest medical institutions are beginning to organize under group medical practice plans; for example, the Mayo Clinic of Rochester, Lahey Clinic of Boston, Truesdale Hospital of Fall



River, etc. Group Medical Practice was the outstanding topic at the last convention of the Massachusetts Medical Society.

It was after five years of successful practice and results obtained in treating the injured in industry under such a plan, that the directors decided to take the step of providing efficient care for the treatment of everyday diseases as well as of those injured in industry, particularly those of limited means.

Reinforcing medicine, surgery, and the x-ray, the Clinic has brought to bear an increasing aid through electro-therapy, hydrotherapy, massage, corrective and therapeutic exercise and electro-surgery under the direction of medical men who are specializing in this latest recognized field of therapy.

On September 2, 1927, the Reconstruction Clinic, 366 Commonwealth Avenue, Boston (corner of Massachusetts Avenue), opened its Department of Physical Therapeutics to the public three evenings each week: Monday, Wednesday and Friday 7:00 to 9:00 P. M.

This step was decided upon by the directors for the following reasons:

(1) Because of the abuse and misuse by non-medical men of physical therapeutic agents such as baking, massage, diathermy, ultraviolet rays, x-rays, etc., as the law does not make it compulsory for one to be a licensed physician to employ these agents in treating disease.

(2) Lack of institutional facilities in Boston, as well as New England, for the treatment of disease through physical therapeutic agents. At present there is but one institution open to the public, in Boston or vicinity, which has a completely equipped department for physical therapeutics under men well trained in that special branch of medical practice; and this institution is only open to citizens of Boston week-days during the day.

(3) It is the intention of the directors to benefit most the man or woman who, though suffering from some illness, cannot afford to leave his or her work to seek relief. The great benefit of such aid to this particular group of sufferers is well illustrated by the last year's report of the thousands treated at the only other evening clinic open to the public; but, unfortunately, at that institution a physical therapy department is not available.

The evening clinic will be conducted by some of the regular Medical Staff of the institution, among whom are some of the most prominent physicians of Boston, who have volunteered their services free for this charitable cause. These facilities and medical treatment will be extended to those of limited means only, residents or non-residents, irrespective of race, creed, or color.

This charitable and non-commercial venture merits the support of the profession and will aid greatly in the advancement of physical therapeutics.

#### "Intestinal Auto-Intoxication" Revamped

There is but little evidence for intoxication from toxins or organisms absorbed from the intestine in cases of constipation.

Constipation presents real mechanical and reflex results familiar under such terms as "biliousness," auto-intoxication, etc., but we have been mistaken in our ideas as to how these phenomena came about.

The signs and symptoms of so-called auto-intoxication—foul breath, furred tongue, impaired appetite, flatulence, nausea, loss of power of attention, depression, restlessness, headache, insomnia, and irritability—are all promptly relieved by an enema. Very well, but a true toxemia could not be banished in equally brief time. "A drunken man is not immediately sobered when his whiskey bottle is taken from him" (Alvarez).

What is the explanation of these phenomena? They

are due very largely to distention and mechanical irritation of the rectum, according to Alvarez. The same effects can be produced by packing the rectum with cotton wool or barium.

It is ripples of anti-persistalsis that produce the feeling of "biliousness," the foul breath and the coated tongue. Thus Alvarez has detected intestinal contents upon the tongue in such cases. The anti-peristalsis is due to the plugging of the intestinal lumen.

It is the physically self-conscious individual who is hypersensitive to visceral stimuli of this sort. The non-neurotic are but little affected. Samson Wright, in his *Applied Physiology*, cites the case of a stolid individual who had no bowel movement from June 18, 1900, to June 21, 1901, and who during that time did his work well and had a normal appetite. The symptoms that ultimately developed were not those of toxemia; he had some pain and abdominal distention and felt weak; there was some loss of weight; these symptoms were promptly relieved by cleaning out the colon.

Wright points out that the rectum is very sensitive. "A rise of internal pressure of 2 to 3 mm. Hg is perceptible, and a rise of 20 to 60 mm. Hg causes much distress. Sensory impulses from the bowl, it is well known, can easily influence the emotion and the mental processes—e. g., sleepiness after a meal, irritability and lack of concentration when hungry. A patient with a jejunal fistula always went to sleep if the intestine was made to contract actively by introducing a small balloon."

So passes the myth of auto-intoxication.

## Miscellany

### New Healing Methods

That the science and art of healing disease are undergoing rapid changes there can be no doubt. Less well known, perhaps, is the rapidity of the change which the medical profession is undergoing, both as to the theories entertained regarding disease, its causes, and nature, and also as to the best methods of healing the ills of mankind. At the recent annual meeting of the British Medical Association, statements were made as to present accomplishment and as to probabilities for the future which seem radical, even revolutionary. For example, the president of the association, Sir Robert Philip, as reported, stated that because of advancement in the treatment of tuberculosis, "assuming the methods are vigorously pressed, I believe my successor at the next Edinburgh meeting—say thirty years hence—will speak of tuberculosis in this country as largely a memory of the past."

In what a contrast is this optimistic statement to the belief generally prevalent scarcely a score of years ago that this "white plague" was incurable. Of equal interest was his prediction that, because of the new methods in healing disease, "hospitals for advanced diseases would be regarded as anachronisms," and that bottles of medicine would be as much of a curiosity as are the "old manuscripts in our libraries or the crude relics of the Dark Ages in our antiquarian museums."

That health is the normal condition of mankind and that disease is for the most part made and therefore should be excluded, was also emphasized by the president. He further declared that the natural state is health and that the fact that it is to be maintained by the exclusion of disease in all its phases and relations is coming to be generally accepted. He did not, however, touch upon the mental aspect of disease, its mental cause,

and mental cure, as did a speaker at the annual meeting of the American Medical Association which was recently held in Baltimore.

The keen interest which the medical profession is taking in the mental factors of disease was evidenced by the attendance upon this discussion, of the largest audience of the Baltimore convention. As reported, Dr. Llewellys F. Barker of that city said, "When this branch of the profession, that is, mental therapy, becomes better and more widely understood, the physician will cut malignant growths from the mind and memory with scalpels of sympathy and compassion as he now removes them from the physical body." Continuing, Dr. Barker remarked how strange it now seems that a physician should ever have thought it sufficient to examine his patients through chemical and physical means; and "that even now much too little attention is given to the thinking, the feeling, and the striving of the sick in comparison with the elaborate physical, chemical, and biological analyses that are made."

These statements of prominent members of the medical profession made at meetings so far apart as London and Baltimore are indicative of the great changes going on in medical practice. As it is coming to be generally recognized that the cause of many diseases is mental, the number of material remedies is in consequence greatly reduced. To the mental attitude of the patient much attention is given, and not a few physicians acknowledge the power of spiritual truth as the greatest healing agency.

—*The Christian Science Monitor.*

**Editor's Note**—The bewilderment of this naïve critic is pardonable. We fear there are worse jolts in store for him.

#### Volsteadism

The monstrous essay at Federal standardization has been broken down. The Volstead law, extending the terms of the amendment and singularly well calculated to reduce it to an absurdity, is without respect from perhaps half the people. The people of State after State vote their dissatisfaction with it. Official dishonesty, violence, social deterioration, drunkenness increase. In any city, in any Commonwealth where the majority spits upon this particular law, enforcement of it, in any real and essential sense, is hopeless. It represents the will of the people of many states as formulated by the Anti-Saloon League. The will of the people of other states is set to break or change it.

Such is, such deserves to be, the fate of a general law where the general will is substantially divided in two; where the rash, intruding hand of the Federal Government interferes in what is pre-eminently a State concern, subject to dominant local opinion. Admittedly, national prohibition was "a new departure." What a prosperous journey it is making!—*New York Times.*

#### The Heredity Factor

(Concluded from page 226)

favorable characteristics and tendencies can be altered to conform to social and behavioristic needs. There are those who are frivolous, severe, sensitive, tender, cruel, frigid, passionate, liberal, radical, bigoted, tolerant and so on in numberless degrees and shades. As these human variations and complexities of character mount, it is not hard to see how insurmountable would be the difficulties of understanding the many motives and the many reasons behind human reactions. Various characters may be differently affected by such exacting influences as ambition, accomplishment, failure, pessimism, optimism

and so on. The problem of analysis confronting the psychiatrist is stupendous, and the reasons for the comparatively slow progress in this science must be apparent.

Emotional and personality variations are not to be considered as the causes of mental disturbances but rather as the structures attacked. So complicated a situation can be created by conflicting and complicated emotional demands that escape into one of the numerous mental states becomes the only refuge and the only salvation,—at least until the storm subsides, the confusion abate, and the intensity of the reactions can be toned down perhaps by psychiatric measures.

If mental conditions are increasing, they are increasing not because there are more defects of heredity handed down to us, or more disease-producing vices acquired, but because it is in the nature of civilization—as an evolutionary process for the survival of the fittest—to create more stresses, more demands and more sacrifices; because the increasing numbers who have advanced educational ambitions demand enormously heightened effort, without taking into consideration individual capacities; and because there is a tendency to divide and subdivide more finely the nervous elements,—make them more sensitive to the barometric changes of life, an without sufficient ability, in this mad upward scramble and competition, to adjust our lives accordingly.

However, the gradation between the normal and the abnormal mentally, is not so sharply drawn as to make it entirely safe even to pass on the actual existence, in a given instance, of a psycho-pathological process,—without passing too easily on the significance of the far more mercurial questions of heredity. This conservatism of itself must take an immense number of individuals out of the class of the psychopathic and, therefore, out of the class of those with permanent handicaps of heredity. But the number of the mentally disturbed who are not under observation or under treatment is so large that estimates in terms of percentages of the mental conditions that may have the heredity factor in them are entirely valueless. Of these, the number who are actually filling useful places in society must be considerable. History is full of the lives of individuals who were apparently disturbed mentally, or who lived in greatly heightened mental states, or who were epileptics or who were morons, all in high places; and quite oblivious to the dire implications of heredity there are those who are still boasting of the blue blood from which they are descended.

Thirty Fifth Avenue.

#### Urology for the General Practitioner

(Concluded from page 228)

frightfully burdened with work as to necessitate my absolute neglect of correspondence. Of course I agree with you heartily in your conclusions with respect to the type of defense put up by ..... in the matter of ..... against ..... tried before me. You of course understand that the defense of venereal disease was not interposed as a complete one in itself but simply to prove that the woman, never having had a venereal disease, could not have been impregnated by the defendant. The records of the Hospital where the child was born show that the mother was not venereally affected and it was this element that gave the defendant hope in the presentation of his defense. I can see very readily how such an argument might have at times succeeded, but chiefly through your guidance and the testimony of Doctor ..... of ..... Hospital, I threw it out and, as you know, held the defendant.

"There is no doubt about it that a man who admits



promiscuous sexual intercourse and with prostitutes weakens his strength as a witness in that he indicts himself as being a person of immoral habits and immoral conceptions.

"The matter in the present issue which chiefly annoyed me was the fact that one of your profession should have testified under oath that his client—the defendant—probably could not have had sexual intercourse at the time alleged by the young woman, because of the venereal disease; and that if such act were consummated it would have without doubt resulted in a transmission of the disease to the woman. On the second day of the hearing and after Dr. . . . testified and after the defendant's physician was closely questioned by me he recanted his former testimony and testified in substantial accord with your views and those of Dr. . . . . . Frankly, it appears to me that he only recanted his testimony after appreciating the fact that he was practically trapped and that I had been assisted very substantially in acquiring sufficient knowledge of the situation on which to base questions which were to that witness rather embarrassing.

"Please accept again my thanks for your deep interest in this problem because I feel it was largely through your cordial assistance that we were able to make the ruling in this case . . . which ruling has been accepted in that no appeal has been filed and all the terms of my decision have been complied with.

"Very sincerely yours,"

I heartily concur with the Judge that the testimony of the physician of the defendant in this case was not creditable. It seems almost that the physician "took a chance" and tried "to get away with something" in behalf of his patient, which would not and could not stand the light of day nor the scrutiny of scientific questioning. It is "expert opinions" such as this which degrade the physician in court and do not elevate him in the eyes of the laity out of court in the ordinary relations of life. It is safe to say that the fewer the examples of conduct of this kind on the part of physicians we see, the better for the standing and authority of the profession at large in the community.

#### Conclusions

1. Gonococcal infection in bastardy cases must be established beyond any question whatever by full frequent and accurate bacteriologic tests and records.

2. Gonococcal infection in the declining stages and after infection has probably been abolished by treatment does not affect fertility in the male.

3. The defense of venereal disease is in most such cases against public policy and tends to degrade and incriminate the defendant and surely does not dignify or elevate the physician who testifies to it without abundant records as proofs.

45 West 9th St.

#### Endocarditis and Meningitis

(Continued from page 237)

subcutaneously and warm normal saline injections into spinal canal after drainage.

Boehneke (*Munchn Med. Wochnschr.*, 1912, LX) believes small doses of ethylhydrocuprein seemed to increase the efficiency of the antipneumococcus serum.

Franz Hamburger (*Wiener Klin. Wochnschr.*, 39: 497-498, April 29, 1926)—advises the expulsion of *all* fluid from the spinal canal by lumbar puncture, and air injected in portions of 10. to 20 c.c. He is able then, to inject 50 to 100 c.c. of serum at one time into children. He cured three out of four cases of cerebrospinal meningitis, treated in this manner.

G. Rosenow (*Deutsche Med. Wochnschr.*, 46: 9-10, Jan. 1, 1920) reports a complete and permanent cure of a case of pneumococcal meningitis with optochin (Morgenroth's), in a woman aged 32 years, who received two intralumbar injections of .03 gm. each of optochin dissolved in 15 c.c. water, and six lumbar punctures. Two other cases of pneumococcus meningitis treated with spinal injections of optochin, failed to improve. He also suggests the administration of *numoquin-Base* by mouth, or even the hypodermic use of optochin.

Blechmann (*Nourisson, Par.*, 9: 179-181, March, 1921) treated a baby girl, aged six months, a case of pneumococcal cerebro-spinal meningitis with external hydrocephalus. Lumbar punctures, drainage, serum, intraspinally and subcutaneously, puncture of right and left subarachnoid spaces, were all tried with no benefit. Cultures showed pneumococcus, although on one occasion a very questionable intracellular meningococcus was seen.

Lafforgue (*Bull. et mem. Soc. Med. d. hop. de Par.*, 45: 264-268; Feb. 25, 1921) treated a case with pneumonia and meningitis; pneumococci in the spinal fluid were found at the end of 36 hours in a bouillon culture—(30 c.c. of cerebrospinal fluid in 250 c.c. of culture medium. A culture made with 5 c.c. of the same cerebrospinal fluid remained sterile). Blood culture in this case also showed the pneumococcus. This was probably a very mild case of meningitis in a patient suffering from right lobar pneumonia. He concludes, by stating that the pneumococcus will be more often found in cases of "meningism," if considerable amounts of cerebro-spinal fluid are cultured, and its dilution in large amounts of medium at least 1:10.

#### ENDOCARDITIS

Edwin A. Locke, of the Boston City Hospital, reported (*Boston Med. & Surg. Jour.*, Vol. 191, No. 20, 913, Nov. 13, 1924), four cases of pneumococcus type I endocarditis occurring on the pneumonia service of this city hospital. He states that at least 50 per cent of the cases of endocarditis complicating pneumonia are due to other organisms than the pneumococcus—the final test being the *actual demonstration of the pneumococci in the valve lesions*. Cases should be recorded as pneumococcus endocarditis only in accordance with such an unassailable criterion. The diagnosis of an existing pneumonia nor even the demonstration of the pneumococcus in the blood stream in a case of pneumonia do not necessarily prove that an existing endocarditis is of the pneumococcus type, according to Locke. In Locke's series of 537 lobar and 298 broncho-pneumonias in 25 years, coming to autopsy, 30 instances of acute vegetative endocarditis occurred, and 120 instances of acute vegetative endocarditis without pneumonia. In only 14 of the 30 cases was the pneumococcus recovered from the valve vegetations. Locke concludes that true pneumococcus endocarditis is a considerably rarer complication of pneumonia than usually supposed.

NOTE.—In a recent conversation with Professor Duncan Graham of the Toronto University Medical School, he informed me that he knows of no case of recovery of pneumococcus meningitis at the Toronto General Hospital, all the cases being fatal. He did have one case of recovery from pneumococcus peritonitis—pneumococci demonstrated in the blood and peritoneal (puncture) fluid. They do not use pneumococcus antibody solution nor antipneumococcus sera in pneumococcal infections.

At Johns Hopkins Hospital during the past two years there were about a dozen cases of pneumococcus meningitis, all fatal.

At the Peter Bent Brigham Hospital during the past five years there were seven cases of medical pneumococcal meningitis, and since 1915 two cases of surgical pneumococcal meningitis, all of whom died.

At the Massachusetts General Hospital, during the past six or seven years, there were twenty-four cases of pneumococcal meningitis, all of whom died.

(To be continued)



### The Rationale of the Newer Medicine

(Continued from page 240)

chemic influence which governs the response of the cell to the elements present in the blood, and which, in turn, have so specific an influence in forming structure and, in consequence, the response of the cell.

The support of the organic cell, whether this be vegetable or animal in its type, is quite similar. Both possess a specific H ion concentration, to which adaptation has been made, and peculiar to the type of organic life that is represented.

And yet, we are but little interested in the H ion concentration and composition of bacterial growth, and have directed little investigation to the concentration of the vegetable cell in respect to beneficial or detrimental effects which may reside in influences of H ion concentration. Until such investigations give available material as to effect upon the nutritive or defensive properties of the human cell, protection against bacterial effects remain undeveloped.

Algae show development of growth through influence of environment. A progression in cell development occurs, through intermediate stages, from plant to animal form, as is beheld in bacterial growth, where certain germ attainment, not long since deemed vegetable, is now accepted as decidedly animal in origin, while other varieties repose in questionable classification.

Distinctions have followed upon the functional evolution of certain germ types, as in the formerly mentioned vegetable types now being declared as of advanced type through the development of features which mark animal cells.

Great variation in cell structure is shown by fresh or salt water algae. Simple, shapeless, microscopic cells, of the lowest order of structural life, may show association in vast combinations, creating large, branching forms, of material length, with gelatinous content and dermal covering. Devoid of root capillarity, absorption occurs through an amoeba-like function, propagation varying from non-sexual division to a higher order of sexual combination.

Occurring in many species, algae, with color variety which distinguishes chlorophyll qualities and benefits, direct their functions in response to the effects of chemic influence. In the form of kelp, algae respond to the effects of iodine and other members of the halogen group. The short step from kelp to higher cell forms shows transition through progressive structural attainment.

Compared with germ growth, organic cells show highly functioning properties, yet the former, seemingly so insignificant in the comparison, have potent function for altering the expression of normal, non-immunized cells of vertebral type.

In order to thrive, bacteria must have food elements similar to the requirements of higher types of animal and vegetable cells.

The necessity for certain nitrogen combinations, upon the part of certain germs showing predilection for preying upon the human cell, is satisfied only by its supply from the vertebral type. In consequence, this germ type is adapted for assimilating animal rather than plant protein.

Bacteria possess a selective faculty for closed rather than open forms of atomic grouping, which creates certain direful effects following bacterial invasion of human cells. Splitting the cell for nutrition, bacteria create cleavage products in the human organism, through the removal of growth values. The waste or remnant of the proteid molecule which remains has undergone alteration through bacterial attack, the linking feature having been

removed. Toxicity occurs from the altered environment or disturbed condition of contiguous cells. Immunity has not here been developed to meet the effects of the localized and enforced presence of bacteria and their cleavage products. The presence and the effects of bacteria are a defiance to the nutritive supply of the organic cell; violent trauma has occurred, with an ensuing cell over-strain.

For nutrition, bacteria appropriate carbon from cell structure, being unable to use the element in either its crystallizable form or dioxide combination, for purposes of energy. This removal of carbon from the molecule destroys the linking feature, cell structure disintegrating with collapse of the molecule affected.

All living cells require the structural unit of carbon to be supplied in other than a crystallizable form. Carbon possesses a specific principle not displayed by any other element, that of self-combination. As the functional purposes of organic cells require fluidity of structure, this is provided in colloidal forms of supplying elements, as in carbon occurrence in this physical form.

The requirement for carbon in responsive and elastic state, for uniting with elements that are capable of uniting therewith under existing forms of life, is found in organic protein, wherein hydrogen, nitrogen, sulphur, phosphorus and oxygen may satisfy an affinity for carbon, in colloidal combinations, and in conformity with the complementary feature that is provided by molecular association.

The sea, as the native or original environment for developing all forms of organic life, furnishes other essential and inorganic contributions necessary to living cells.

Organic combinations are forever reforming from similar combinations, at a no less rapid rate than at which molecular structure dissolves, and it is this self-generation and formation of the cell that displays vital existence.

### V

Bacteria and human cells prefer nitrogen-free compounds in biose and hexose combinations, which are more acceptable to present standards of existence than compounds of four, five or other combinations which are not triad multiples. In consequence, too, the fact is shown why bacteria find a more acceptable provision in animal than plant supply of nutritive compounds, an evidence of adaptation.

Within the intestinal tract of man, many ingested proteids form harmless waste, through the ease of oxidation with ensuing disintegration.

The closed chain or ring forms of atomic grouping, as in the aromatic, cyclic or benzene structural formation, and as duplicated in cellular organisms, are more resistant to metabolic destruction than the open or paraffin combinations.

In the human cell, when toleration for altered forms has not been established by immunity development, the minutest alteration of proteid structure produces a severe cell strain.

The isomeric forms, which are of common occurrence in chemistry, commonly apply to the formation of proteid structure, wherein combinations of seemingly identical elements may, through the most subtle influence, follow utterly separate and specific routes in expression, revealing no apparent line of demarcation between animal and vegetable kingdoms.

For purposes of nutrition, bacteria select the glycerol type of combinations, as mannitol, which is an unfermentable sugar. This preference in declining alcohol-typed compounds creates a somewhat vicious effect upon the normal intestinal tract of man.

Activity of bacteria within the human intestine, in ap-

appropriation or alteration of normal food products of man, proves instrumental in the appearance of symptoms or of altered nutritional states, seemingly unrelated in effects, and of the most confusing variety and character. Altering the intestinal flora or character of nutritional supply frequently corrects conditions which are, seemingly, utterly foreign to digestive or nutritional conditions.

Plant growth possesses the special function, not present in animal or bacterial cells, of converting, by catalytic activity, carbon dioxide, oxygen and water into starches and carbohydrates. These are compounds which are necessary for the growth of both bacterial and animal cells, and must by them be secured from plant forms which react to radio-active stimulus.

Radio-activity illuminates the problem of cell complement, which is so directly associated with and dependent upon a provision in preformed food, in the form of protein, fat and carbohydrates, as supplied to the organic cell from plant growth.

Organic life depends upon a sun-contributed energy. Warming effects from ocean currents, which generate and promote sea growth of plant and animal forms, facilitate storage of iodine, the dependence thereon for biologic expression being required for present forms of human existence. Seasonal changes and atmospheric conditions that are created, with the variation of electro-potential that occurs, serve to influence chemic expression and show the effects of fluid energy from the seas of earth.

The dependence of all forms of organic life upon energy, transmitted through rays of the sun, shows the adaptation to catalytic effects and activity upon the part of animal cells which produce a self-supporting nutritional media, providing a similar nutrient as required by higher typed cells.

## VI

Nuclear absence in bacteria does not preclude comparison with vertebral cells, which carry nuclear bodies, for, fifty per cent of bacterial ash is composed of phosphorus, a seemingly essential element for composing nuclear substance, and which occurs largely in the nucleic glyco-proteids which comprise most of the substance of bacterial cells.

The variety and amount of nucleic acid or nucleic substance that occurs in bacteria designates the derivation of bacteria, as to vegetable or animal origin. The tubercle bacillus, now deemed to be of animal origin, is so determined through its content of nucleic acid.

In bacteria, the amount of oxygen present parallels the quantity of nucleic acid present. Methylene blue can only stain bacteria when both oxygen and nucleic acid are present.

The resistance of certain bacterial forms to the destructive effect of certain agents, as antiseptics, is due to the presence of oxygen and nucleic acid in the germ.

Certain bacterial forms succumb to destructive agents through loss of bacterial oxygen, as in spirochetes, where destruction by arsenic compounds occurs by arsenical oxidation at the expense of spirochetic possession.

Living requirements of saprophytic bacteria demand that the organic matter serving as nourishment must undergo transformation into simpler compounds before being of suitable nature for nutrition.

But little real difference exists between the nutritional needs of bacteria and cells of vertebral type. In both the nutritive material must undergo preparation, in conformity with the requirements of the cell form, and agreeable to the period or stage of cell growth.

The influence of heredity in developing function for assisting cell growth is plainly shown, as demanded in the adverse conditions that confront cellular life.

A change in the character of development is shown by bacteria when they are subjected to conditions of environment which are unfavorable to their customary mode of growth.

A departure from the former standard of development may not be restored despite the return to the former state of environment. The variation from the former standard is fixation in type, and depicts an adaptation occurring through refractory defense, for which complementary provision in defensive and generative function has been acquired.

The alteration in bacteria which this process creates may develop branching forms, revealing a progression toward different and possibly higher types of order, requiring keen analysis for comparison with and separation from a more complex typed form of organic character.

Mendel's findings served to show that there exists an objection upon the part of cell life to revert to earlier forms, or recessive heredity, which in substance means objection to the forfeiture of complement once earned. The cell shows its inclination to profit through impulse contributed by higher attainments, and to express the powers reposed in complement, which develops the higher types of existence. So is shown the common origin, wide distribution and distinction that occur in organic species.

Normal cells found in the circulation of vertebrates show characteristics common to bacterial cells in reaction to certain stains which dye granules.

The requirement of bacteria for hydrogen, oxygen and inorganic salts is a demand that is identical with that of organic cells of the highest type.

Mestrel and Janet found that cell metabolism shows that an interdependence exists between colloids and mineral elements in the cell, as an evidence of complementary activity in fixation of cell components.

Bacteria that are pathogenic to the human cell, through needs other than for expression of energy, acquire forms of organic nitrogen, as in the combination of  $\text{NH}_4$ , through de-aminizing amino-acids and ammonia.

To express energy, bacteria oxidize carbon and hydrogen.

Certain germ types, as bacillus proteus, bacillus coli and some other forms, de-aminize alanin or alpha-propiotic acid, and produce indol. This is then carried to the liver of the vertebral species affected, and oxidized to indoxyl. The process releases carbon, which is oxidized by the bacteria so selecting it, for needs of bacterial energy, without, however, being able to secure enough carbon for organic needs.

Bacterial activity within the intestinal tract of man releases indol from tryptophan, by a process similar to the production of indol from alanin, thus serving the thyroidal function, so closely identified with tryptophan occurrence and change in the intestine.

The normal skin prevents the entrance of and provides local immunity to the effects of surface bacteria, showing the deposit of some fixation complement superficially, evidently supplied as a result of skin exposure, through environmental effects in the archaic periods of cell development.

This is of plain proof in Muller's finding that intra-cutaneous injections produce less defensive fixation than occurs in other attacks of the organism. Intra-cutaneous injections of aolan, for instance, increase the urethral secretion in cases of posterior gonorrheal infection. This method of attack creates a sensitivity of one to a hundred per cent more than that which is shown by other routes of aolan introduction, as by the sub-cutaneous, intra-muscular or intravenous methods, this method